

## THE MANAGEMENT OF ISCHAEMIC (CORONARY) HEART DISEASE\*

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Without belittling in any way the valuable contribution which can be made in the management of ischaemic heart disease through therapeutics, it is still true that the most important aspect of management is what is said to the patient and his relatives by the doctor in charge. There is a great deal of iatrogenic heart disease resulting from errors of commission and omission on the part of the medical practitioner in the verbal management of ischaemic heart disease. These errors arise in part from uncertainty as to the prognosis in the individual case, either in terms of natural history or in terms of the modification of natural history which can be achieved by medical management or therapy. It will probably always be difficult to assess individual prognosis, as in many other diseases; the best that can be done is to form a judgment on group prognosis and assume that the patient may well do better than the average. This optimism is better for the patient than the reverse pessimism.

Few doctors now make the mistake of attributing the pain of myocardial ischaemia to indigestion, but many patients make this mistake and do not report to their doctors. Furthermore, there is more and more evidence for infarction without pain. For these reasons unexplained breathlessness or arrhythmia among the classes of people defined later as being 'at risk' of ischaemic heart disease justifies careful examination and electrocardiography.

This commendable consciousness of the wide prevalence and potential severity of the disease leads some doctors to give the patient an exaggerated impression of the potential severity during the period of diagnostic uncertainty which is often unavoidable. Patients are often unnecessarily frightened by the opinion given by the doctor at the first consultation. In doubtful cases some such words as 'I believe' or 'I hope that this is not a coronary heart attack but I can't afford to take the risk of not confining you to bed until electrocardiography and two or three days of observation have excluded the condition' will save patients much unnecessary worry. When the diagnosis is established it is much easier to correct the preliminary opinion in a direction of greater gravity than to dispel unnecessary and unjustified fears which have been raised in the patient's mind.

For practical purposes, ischaemic heart disease is the result of atheroma or atherosclerosis of the coronary arterial trunks. Other rare causes will be ignored in this discussion. Atherosclerosis may be very local and may in some cases be precipitated into occlusion by subintimal haemorrhage or other mechanisms which are at present obscure. In general, however, both coronary trunks are considerably occluded before infarction occurs. The cause of the infarction is often obscure, but in the majority of cases it is due to thrombosis of blood in a small segment of one trunk (coronary

thrombosis from occlusive thrombogenesis). Myocardial infarction without coronary thrombosis is still a little mysterious; in some cases it is undoubtedly due to effort of sufficient intensity to render the blood flow through narrowed arteries inadequate for the oxygen requirement of the very active myocardium. This variety of causation will be facilitated by myocardial hypertrophy as in hypertension, or by failure of the oxygen-carrying capacity of the blood resulting from anaemia or methaemoglobinaemia. In other cases it is not unreasonable to assume that the coronary system, or a small segment of one of these trunks, undergoes functional narrowing of the lumen through vasoconstriction. Such precipitating events as exposure to a cold wind, excitement and anger, or effort on a full stomach, are suspected to operate in this way. In the last resort, however, we must recognize that a certain proportion of cases of infarction are not explainable in terms of coronary occlusion by thrombosis or of any other mechanism which is at present understood.

Any pathologist will confirm that severe coronary atherosclerosis is often seen at autopsy in the absence of any clear evidence of infarction. Indeed, Morris has deduced from the evidence of the Bernard Baron Institute of Pathology that the extent and severity of coronary atherosclerosis has not increased in the London population over the last 3 decades although there has been a great increase in myocardial infarction in the same population over the same period of time. Unless Morris's deduction is refuted we must conclude that the modern epidemic of myocardial infarction is determined by an increase in those factors which precipitate infarction as opposed to those factors which cause atherosclerosis; in other words, the study of occlusive thrombogenesis may be more rewarding than the study of atherogenesis in explaining the increasing prevalence of myocardial infarction. It is admitted that the mechanisms through which blood is caused to coagulate within a segment of a narrowed coronary artery (occlusive thrombogenesis) are not at present understood and may not represent all the mechanisms whereby myocardial infarction is precipitated; nevertheless, they must be very important for study. By the same token, therapy through anticoagulant drugs may have a sound basis in theory.

The encouraging feature in the outlook of the last decade is the epidemiological demonstration that myocardial infarction, as diagnosed, is increasing in prevalence among the privileged groups of the more developed races. If it be accepted that this is not due to better diagnosis, then we must conclude that it is due to recently operating and, therefore, remediable aspects of the environment of these privileged groups. This view is supported by the Norwegian statistics for mortality from myocardial infarction during and shortly after the Second World War. It also gives reason-

\* Paper presented at the Plenary Session on Heart Disease during the 42nd South African Medical Congress (M.A.S.A.), East London, C.P., September-October 1959.

able hope for an improvement in the next decade in what has been a deteriorating trend in the last decade.

If the factors responsible for the recent increase are concerned with the mechanisms of occlusive thrombogenesis, we might expect a distinct difference between White and Bantu blood in South Africa in respect of coagulation mechanisms and fibrinolysis. The disappointing results reported by Merskey *et al.* do not necessarily negative the theory of increased thrombogenesis. It may be that we have not yet developed techniques of *in vitro* study adequate for the recognition of disturbed coagulation mechanisms *in vivo*. This possibility is a challenge to haematologists who are interested in this field. There is considerable evidence that postprandial lipaemia from fatty meals may be connected with some form of increased *in vivo* tendency to coagulation.

Turning to the consideration of atherogenesis, although Morris's figures do not support the idea of increasing severity of atherosclerosis in the London populations affected by the great increase in myocardial infarction, we can nevertheless point to the considerable difference between South African Whites and Bantu in respect of atherosclerosis of the aorta and coronary trunks. There can be no doubt that there is a very considerable difference between the two races in the extent and severity of atherosclerosis in these two regions, although the Bantu is by no means in such a favoured position in respect of cerebral atherosclerosis. This dissociation in the extent and severity of atherosclerosis between the aorta and coronary trunks on the one hand and the cerebral arteries on the other hand has also been observed in Japan. It is extremely puzzling but does not concern us in the present discussion.

#### Disturbed Lipid Metabolism

The most hopeful aspect of the study of the epidemiology of ischaemic heart disease is the link between disturbed lipid metabolism and myocardial infarction.

In general those diseases which are associated with hypercholesterolaemia (e.g., diabetes and familial xanthomatosis) show a high prevalence of ischaemic heart disease.

Apart from such diseases, the privileged groups who suffer from the increasing prevalence of myocardial infarction are the groups who have high levels of total serum cholesterol in their blood, and who consume large quantities of fat, especially saturated fat, in their diets. The evidence for this association has been fully reviewed elsewhere. The link between dietary fat and serum-cholesterol levels is now clear. The link between high serum cholesterol and myocardial infarction might be through either or both of the mechanisms described above as thrombogenesis and atherogenesis. If the link is through thrombogenesis there is great hope for immediate reduction of mortality from myocardial infarction. If it is also through the mechanisms of atherogenesis, there is reasonable hope that this pathological process, for so long regarded as an inevitable result of aging, may be in part preventable.

Applying these principles to the management of coronary heart disease we have felt that a diet which reduced serum cholesterol is likely to favour prognosis in general in those who are at risk of coronary heart disease. This term 'at risk' will include those who have already had symptoms, those who have a strong family history, and those whose serum cholesterol is consistently high. We do not yet know the

normal range for men of 40-50 years, but in general 275 mg. % may be taken as too high and figures between 275 and 225 as worth trying to reduce. We have shown that the majority of men with serum cholesterol figures above 225 will drop their level towards or to below 225 mg. % for as long a time as they consume 50-75 g. daily of an unsaturated oil such as sunflower-seed oil. The same result can probably be obtained by reducing dietary fat calories to 30% and substituting unsaturated oils for at least half of the total. This dietary adjustment can be made without undue discomfort to the patient and his household. Jolliffe *et al.*<sup>4</sup> have confirmed these findings in New York with his 'prudent diet'. In the present uncertain state of our knowledge we have not felt justified in making recommendations for populations in general or for people not at risk. There are many other ways in which the diets of populations with high prevalence of myocardial infarction differ from those of populations with low prevalence. These differences have been reviewed and in the present state of our knowledge the quantity and quality of dietary fat appears to be of greatest relevance. Advancing knowledge, however, may bring other factors to light.

The application of these dietary principles can be combined with any other method of therapy, including the short-term or long-term use of anticoagulants which will be reviewed by Dr. Suzman.\* This appears to be the most promising line of drug therapy at present. Its value for periods up to 2 years after the last infarction has been supported by a careful study by the Medical Research Council of Britain, although there are still many dissenting voices.

Oestrogen therapy has given conflicting results in the hands of Oliver and of Katz. In full dosage the discomforts and disadvantages are such that a stronger case is required to support their use. A recent report with doses much smaller than conventional is encouraging, but will require critical examination and confirmation. In my opinion, oestrogen therapy cannot at present be recommended.

#### Treatment

In practical management coronary heart disease can be divided into 4 grades of severity. The management will be discussed in relation to these 4 grades.

1. *Angina pectoris on effort without infarction and with normal electrocardiograph.* If the ECG can be decisively altered by effort, then the patient is at risk. If the ECG is not altered by effort, the patient is nevertheless at risk if the symptomatology is clear cut. The explanation given to the patient is of paramount importance. It must be adapted to the patient's personality and circumstances. It is preferable to err on the side of optimism because angina pectoris can so easily be complicated by anxiety neuroses. On the other hand, the diagnosis must not be taken lightly. Physical effort should be maintained to the limit of capacity without pain, but the limit must definitely not be exceeded and nitroglycerine should not be used to achieve greater physical effort performance. The use of that drug for the relief or prevention of angina resulting from emotional strain and causes other than effort is however entirely legitimate and often constitutes the only effective therapy. Rest should immediately be enforced and anticoagulants used if the angina

\* Dr. M. M. Suzman contributed a paper at the Congress on the use of anticoagulants.

should develop crescendo qualities not related to effort; this sequence suggests impending infarction. The patient should avoid heavy meals and particularly exertion soon after meals. If he is over-weight, his calories should be reduced. His serum cholesterol should be determined by a reliable laboratory with reasonable agreement between at least two readings. If the mean is above 275 mg.% restriction of total fat and a swing towards unsaturated fats should be recommended as discussed above. The same recommendation is reasonable at mean levels between 275 and 225. At lower figures, the diet has less rationale but a case may still be made on the assumption that the individual may have a postprandial lipaemic tide which encourages thrombosis.

2. *Patients who have survived mild infarction without arrhythmia, angina decubitus or myocardial failure* may be treated in exactly the same way as the group I.

3. *Patients with persistent angina decubitus or those in whom the angina is more related to tension and excitement than to effort* constitute a most difficult group. The treatments recommended for groups I and II should be applied but in addition special measures may have to be taken for intractable pain. The psychic and emotional aspects of this pain are well appreciated but not easily handled. The most important consideration is to prevent a vicious circle by adequate explanation and reassurance, with reasonable optimism and conviction. Once the vicious circle is established, psychic handling is, in my experience, not of great value. There are certainly unexplained aspects of angina pectoris and it is unfair to attribute all of these to psychic mechanisms. Nitroglycerine and related vasodilators are the stand-by of treatment. If they fail, and life becomes intolerable, after a long enough period of trial and adjustment it may be desirable to render the patient hypothyroid as the lesser of two evils. Many other treatments have been used, but none have stood the test of time and we have to confess that in this group medical treatment is far from satisfactory.

4. *Patients whose infarction has been followed by permanent arrhythmia and/or congestive cardiac failure.* The treatments appropriate to these two complications will be of primary importance. At this stage, angina decubitus will seldom be a problem. Caloric restriction for weight reduction when indicated, or salt-restriction for the relief of congestive heart failure, will be the most important parts of dietary treatment. Exercise should not be unnecessarily restricted, although it is usually necessary to put a considerable brake on physical activity and on strenuous and tiring days.

The place of surgical treatment is not ignored but space does not allow the necessary critical consideration. In my opinion, the case has still to be made for most forms of surgical correction. I do not decry carefully controlled surgical experiments with adequate and prolonged follow-up, preferably by someone other than the operating surgeon. On the other hand, no surgical operation has yet fulfilled the criteria for general application. Surgical techniques will include (1) interruption of pain fibres for intractable angina and (2) various operations for the promotion of collateral blood flow. Thyroidectomy for the reduction of basal metabolism tends to be replaced by thiouracil and related drugs or by radio-active iodine.

## ADDENDUM

Since preparing this paper for Congress I have personally visited most of the groups in the USA and Britain from which important contributions have been made, and have attended the Gordon Lipid Conference (July 1959). It is possible therefore to bring recent views and trends right up to date.

There is intense activity in many fields, most of it represented at the Lipid Conference. A whole session was devoted to the lipid components of *in vitro* coagulation mechanisms. The study of lipids and their metabolism will rapidly advance under the influence of the new technique of gas chromatography. A promising start has been made in the study of *in vivo* thrombosis in isolated vein segments.

There is further evidence for genetic variability in lipid metabolism, and particularly in the response of total cholesterol and other lipid fractions of the serum, and in the duration of the postprandial lipid tide, when groups of people are fed with different quantities and qualities of fat.

It is evident that total-serum-cholesterol levels in man can, when they are too high, be reduced effectively by a great variety of methods. These include diet, oestrogen therapy, large doses of nicotinic acid, hydralazine, and neomycin. There is still no evidence that effective reduction can be achieved by any small-dose fraction of lipids or vitamins at present commercially available in South Africa. Dr. G. E. Burch has referred to certain new therapeutic preparations for the reduction of serum cholesterol. They sound promising but are still under clinical trial in the USA.

However there is still no direct evidence that mortality and morbidity from ischaemic heart disease is favourably influenced by these manoeuvres even though they reduce total serum cholesterol. Nevertheless there must be few who would not give their patients the benefit of the doubt and advise reduction of immoderately high serum-cholesterol levels (see main text for figures) in people at risk of ischaemic heart disease. The statistical association of these high levels with ischaemic heart disease is too close to be ignored when there are so many possible mechanisms of causal association.

The American Council on Foods and Nutrition<sup>2</sup> finds itself at present unable to give advice on how reduction of serum cholesterol should be achieved, but publishes 5 articles to illustrate current trends of thought. I have no doubt that sensible dietary principles should always be recommended to people at risk whether or not other methods of reducing serum cholesterol are added to the dietary regime. On the other hand I think some people are pressing dietary restriction too severely. Our regime has been published as a guide.<sup>3</sup> Jolliffe *et al.*<sup>4</sup> have demonstrated effective reduction of serum cholesterol by a similar type of diet, which they call 'prudent'.

## REFERENCES

1. A full list of references is given in the following two publications:  
(a) Brock, J. F. *et al.* (1959): *Postgrad. Med. J.*, 35, 216.  
(b) Brock, J. F. (1959): *Nutrition and the Clinician* (Humphry Davy Rolleston Lectures to the Royal College of Physicians). *Lancet*, in press.
2. Council on Foods and Nutrition (1959): *Symposium on Significance of Lowered Cholesterol Levels*. *J. Amer. Med. Assoc.*, 170, 2198.
3. Gordon, H. and Brock, J. F. (1958): *S. Afr. Med. J.*, 32, 907.
4. Jolliffe, N., Rinzler, S. H. and Archer, M. (1959): *Amer. J. Clin. Nutr.*, 7, 451.



## REACTIONS TO T.A.B. INJECTION

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Although a voluminous literature covers the antigenic properties of the various types of T.A.B. vaccines and the immunity conferred by them, there are very few references to the reactions which occur after inoculation with T.A.B.

With the recent typhoid scare in Johannesburg mass inoculation campaigns were carried out. This report deals with reactions occurring among members of the staff of this hospital who were inoculated. A total number of 264 persons were vaccinated, the scheme of inoculation being to give a dose of 0.5 c.c. of T.A.B. endotoxoid, followed in 10-14 days by a further dose of 1 c.c.: 143 persons received 2 injections, and 121 had only 1 injection and did not return for the second, either because they could not be bothered to do so, or because the first reaction was so severe that they were afraid to have a second one.

A questionnaire setting out a list of possible symptoms was sent out to all persons inoculated, and 129 were returned. The information obtained is contained in the following table:

		1st Injection	2nd Injection
<b>Local Signs</b>			
Swelling	.. ..	92	83
Itching	.. ..	47	44
Pain	.. ..	95	87
<b>General Signs</b>			
Headache	.. ..	57	43
Giddiness	.. ..	21	20
Nausea	.. ..	25	18
Vomiting	.. ..	9	8
Abdominal pain	.. ..	9	4
Diarrhoea	.. ..	7	7
Cough	.. ..	6	10
Tightness of chest	.. ..	6	5
Redness of eyes	.. ..	7	7
Running nose	.. ..	18	16
Skin rash	.. ..	6	8
Swelling of glands	.. ..	19	16
Fever	.. ..	32	24
Drowsiness	.. ..	25	25
Totals	.. ..	481	428
No reaction at all	.. ..	8	12

## COMMENTS

Some of the general reactions are worthy of comment. Two individual cases of special interest are described below.

1. Two days after the first inoculation Mrs. L.K. (author's wife) developed right-sided conjunctivitis with muco-purulent exudate and peri-orbital oedema; 2 days later she became pyrexial and generalized adenopathy developed; this lasted 2 more days, when recovery occurred spontaneously.

2. Miss J.M. had what was thought to be her first inoculation at about 7 a.m. on 5 August 1959. At 10.30 a.m. she felt out of sorts and shortly after this had a minor type of seizure. Peculiar episodes, which were of 2 main types viz. (a) an almost catatonic stupor and (b) bouts of hyperventilation, occurred at 2-5 minute intervals during the first day and at longer intervals during the following 2 days. During both types of episode the pupils were dilated, and no contact whatever could be made with the patient. There were no physical signs of note besides low-grade pyrexia. The cerebrospinal fluid analysis was normal. The blood leucocyte count went up to 20,000 per c.mm., with 85% neutrophilia; this figure came back to normal level over the course of 5 days, by which time recovery was complete. At this time a further

history was obtained that a similar episode had occurred about 5 years before, when a previous T.A.B. endotoxoid injection was given. Giffin and Rogers<sup>1</sup> state that few lesions of the central nervous system have been reported after inoculation against typhoid; of these all have shown a demyelinating lesion. It is felt that Miss J.M. was a case of organic cerebral reaction to T.A.B. injection.

Although Bamforth<sup>2</sup> states that the reaction following the first injection is usually worse than the one following the second, this has not been fully borne out by this survey, in which there were 481 items of reaction to the 1st injection and 428 to the 2nd.

One of the patients inoculated had a booster dose only, because he had been given T.A.B. vaccine while in the army. This patient had what was probably one of the worst generalized reactions reported. Turner<sup>3</sup> says it is thought that previous inoculation with T.A.B. may produce sensitization of the organism, and this is certainly something to be borne in mind as being responsible for some of the severe reactions.

Of the 7 patients reporting redness of the eyes after the first injection 4 were unilateral, of which 3 were in the right eye. It is tempting to suggest that the patient contaminated the right eye by rubbing the injection site on the left arm and introducing some of the vaccine—a small amount of which was noted to have leaked back along the needle track in a large number of cases—into the right conjunctival sac. On the other hand, T.A.B. injections have been used in ophthalmology as treatment for a variety of inflammatory conditions of the eye, the rationale being to produce local hyperaemia in the eye as part of a general non-specific protein shock;<sup>4</sup> it is possible that some of our cases of redness of the eyes may have had a latent conjunctival or bulbar condition which was made manifest by the T.A.B.

Skin rashes occurred after the first injection in 6 patients; the nature of the rash in 5 of these appeared to be urticarial. One patient developed pityriasis rosea shortly after the inoculation, which was probably coincidental.

Two patients developed what appeared to be generalized sensitization reactions, accompanied in one case with periorbital oedema, generalized itching, vasomotor rhinitis and bronchospasm. Both patients responded well to anti-histaminic therapy. Friedman *et al.*<sup>5</sup> reported an allergic asthmatic reaction caused by silk as a contaminant in T.A.B. vaccine; it is not, however, suggested that this was the case here.

Shih P'eng Tor<sup>6</sup> has reported that the incidence of side-reactions after intradermal inoculation of concentrated typhoid vaccine was much less than those following the usual subcutaneous immunization, and in mass immunization campaigns it may be of value to explore this new method as a way of conserving man-hours and making T.A.B. vaccination, which is, I feel, by far the most unpleasant of routine inoculations, a little more pleasant.

## SUMMARY

The reactions of 264 subjects inoculated against typhoid fever are reported and some of the less common reactions are commented upon.

I wish to thank Dr. H. Rompel, Superintendent, South Rand Hospital, Johannesburg, for permission to publish this article.

## REFERENCES

1. Giffin, M. E., Rogers, M. H. and Kernahan, J. W. (1948): Arch. Neurol. Psychiat. (Chicago), 59, 233.
2. Bamforth, J. (1951): Practitioner, 167, 241.
3. Turner, R. (1959): S. Afr. Med. J., 33, 639.
4. Ridley, F. and Sorsby, A. (1940): Modern Trends in Ophthalmology, p. 499. London: Butterworth.
5. Friedman, H. J. *et al.* (1957): J. Allergy, 28, 489.
6. Shih P'eng Tor (1958): Chin. Med. J., 77, 27.

## BOEKE ONTVANG : BOOKS RECEIVED

**Basic Bacteriology.** Its biological and chemical background. 2nd edition. By Carl Lamanna, Ph.D. and M. Frank Mallette, Ph.D. Pp. xiii + 853. Illustrations. 108s. and \$13.50. London: Baillière, Tindall and Cox Ltd. Baltimore: The Williams and Wilkins Company. 1959.

**Das Röntgenschnittbild.** Von Prof. Dr. A. Gebauer, Doz. Dr. E. Muntean, Prof. Dr. E. Stutz, und Prof. Dr. H. Vieten. Pp. xvi + 446. 699 Abbildungen in 894 Einzeldarstellungen. Ganzleinen DM 148.00. Stuttgart: Georg Thieme Verlag. 1959.

Suid-Af

Ons het al die probleme in ons besprokingsbejaardes is van die groeibesprek.

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Toestans twyfel meegenoege lees soos ons aafgelope ty van die a van persoon was die o Pollock<sup>4</sup> se verdubbel toename gsklerose. nie omdat vol was, persone gword.

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DIE PROBLEEM VAN SENIELE BEJAARDES

Ons het al by verskeie vorige geleenthede<sup>1,2</sup> hier geskryf oor die probleme van die toenemende ouderdom. Ons het toe in ons besprekinge hoofsaaklik verwys na die neiging tot 'n proporsionele en absolute vermeerdering van die aantal bejaardes in die bevolking, en ons het die aanpassingsprobleme van die groot aantal min of meer bejaardes in die samelewing bespreek.

Daar is egter een besondere faset van hierdie probleem wat ons nie in besonderhede behandel het nie en waarop ons nou meer breedvoerig wil wys, naamlik, die probleem van die groeiende aantal bejaardes wat liggaamlik redelik gesond bly, maar wat tekens van seniliteit in die een of ander graad toon.

Toestande van arteriosklerose en seniliteit kom sonder twyfel meer voor by oumense omdat soveel meer mense lank genoeg leef om die seniliteitsperiode te bereik. In Engeland, soos ons aangetoon het,<sup>1</sup> was daar byvoorbeeld gedurende die afgelope twee of drie dekades 'n klein beduidende toename van die aantal toelatings tot hospitale vir geestesversteurdes van persone oor die ouderdom van 64 jaar.<sup>3</sup> In Amerika was die ooreenkomstige syfer baie meer opvallend. Volgens Pollock<sup>4</sup> se syfers het die gevalle van seniliteit in New York verdubbel tussen 1920 en 1942, en daar was 'n viervoudige toename gedurende dieselfde periode van gevalle van arteriosklerose. In Suid-Afrika is syfers van hierdie aard nie bekend nie omdat die meeste van ons hospitale vir geestesversteurdes vol was, en is, en baie aansoeke om toelating van seniele persone gedurende die afgelope aantal jare afgewys moes word.

Die probleem wat ons nou egter veral wil bespreek is nie soseer die kwessie van die toelating van gevorderde (geestesversteurde) gevalle van seniliteit tot hospitale vir geestesversteurdes nie, maar die moeilike probleem van die groot aantal bejaardes wat vroeë tekens van seniliteit en serebrale arteriosklerose toon, en wat hulle heenkome in die samelewing moet vind.

Alhoewel statistiese gegewens nie bekend is nie, kan ons nogtans op grond van die algemene kliniese ervaring van dokters en maatskaplike werkers konstateer dat daar duisende bejaarde persone is wat so 'n graad van seniliteit bereik het dat hulle nie as geestesversteurdes gesertifiseer kan word nie, maar wat dit nogtans baie moeilik maak vir hulle om hulle aan te pas, en wat dit ook moeilik maak vir familieledes om na hulle te kyk.

Die tekens van toenemende vroeë seniliteit is soos volg: Daar is 'n versteuring van die geheue en 'n inperking van belangstelling. Slapeloosheid en rusteloosheid tree in, wat soms lei tot 'n wandelsug in die dag en selfs in die nag. Die versteuring van die geheue, wat veral gekenmerk word deur vergeetagtigheid en nalatigheid om die gewone daaglikse

pligte uit te voer, lei tot prikkelbaarheid en opvlieëndheid. Hierdie emosionele onstabiliteit gaan soms oor in aktiewe aggressie en dikwels is daar uitgesproke agterdogtige neigings. Slordigheid en onnetheid tree in met 'n afstomping van gevoelswaardes en onaanneemlike gewoontes van persoonlike higiëne.

Aangesien ons grotendeels 'n gemeenskap van dorps- en stadsbewoners geword het, en daarbenewens 'n gemeenskap van kamer- en woonstelbewoners, is dit dus duidelik dat die versorging van bejaardes met seniele neigings 'n groot probleem word. Hulle aanwesigheid in huise en woonstelle lei dikwels tot wanaanpassing in die gesin, en hul invloed op kinders (klein en groot) is soms sterk onheilsaam. Aan die anderkant weer het hierdie persone versorging nodig en is hulle ook daarop geregtig.

Die probleem van die bejaarde vroeg-seniele persoon moet dus met oorleg en visie aangepak word. Een moontlike soort benadering is die stigting van spesiale tehuise vir seniele bejaardes. Die eerste tehuis wat spesiaal vir seniele oues van dae in Suid-Afrika gebou is, heet die Van Rensburg-monument-tehuis, en dit is onlangs amptelik in Pretoria geopen. Die gebou is spesiaal deur die argitek vir hierdie soort persoon ontwerp. Daar is onder andere spesiaal-beplande badkamers en waskamers met vloere waarop die oumense nie kan gly nie. Ook is daar wye gange en deure en portale. Die voorbeeld van die Vrouevereniging in die Transvaal wat hierdie projek aangepak het (Die Suid-Afrikaanse Vrouefederasie), is inderdaad navolgingswaardig.

'n Ander moontlike soort benadering is die ontwikkeling van toesigsdienste en raadgewing deur spanne van besoekende maatskaplike werkers. Die onkoste wat verbonde mag wees aan so 'n stelsel van maatskaplike toesigsdienste mag hoog klink, maar in terme van die uiteindelike welsyn van 'n groot deel van die gemeenskap, en veral van sy kinders, sou ons kon sê dat dit geld is wat goed spandeer word.

As gevolg van die verhoogde lewensverwachting van die gemiddelde persoon, en as gevolg van die nuwe omstandighede wat daar as gevolg hiervan ontstaan het, het ons as 'n gemeenskap van leke-persone en dokters voor 'n nuwe probleemgesteldheid te staan gekom wat nuwe uitdaginge aan ons bied. Ook op hierdie gebied moet die voorkomende medisyne sy bepalende rol speel as deel van 'n visionêre en verbeeldingryke benadering van die breër probleem van gemeenskapsbeplanning.

1. Van die Redaksie (1958): S. Afr. T. Geneesk., 32, 632.

2. *Ibid.* (1959): *Ibid.*, 33, 575.

3. Lewis, A. J. (1946): J. Ment. Sci., 92, 150.

4. Pollock, H. M. in Kaplan, O. J., red. (1945): *Mental Disorders in Later Life*, p. 448. Londen: Standard University Press.

ELDERLY PEOPLE WITH SENILE TENDENCIES

On previous occasions<sup>1,2</sup> we have discussed in this *Journal* the problems of increasing age. We were then chiefly concerned with the tendency towards a relative and absolute increase in the number of aged people in the population

and with the problems of adjustment that inevitably arise from this situation.

One facet of this problem, which was not discussed in detail, is the problem of the increasing number of elderly

people whose physical health remains fairly sound, but who show signs of senility in some or other form.

Conditions of arteriosclerosis and senility are undoubtedly becoming more common among old people owing to the fact that so many more people live long enough to reach the stage of senility. In England, the past two decades have shown a small but significant increase in the number of patients over the age of 64 admitted to mental hospitals.<sup>3</sup> In America the corresponding figure was much more striking. According to Pollock,<sup>4</sup> the incidence of senility in New York was doubled between 1920 and 1942. During the same period there was a four-fold increase in the incidence of arteriosclerosis. In South Africa the figures in this connection are not known because most of our mental hospitals have been, and still are, filled to capacity so that many applications for the admission of senile patients have to be turned down. However, the problem which we wish to discuss now is not the admission of advanced cases of senility (clearly disordered cases) to mental hospitals, but the more complex problem of the great number of elderly people who show early signs of senility and cerebral arteriosclerosis, and who have to be cared for in the community.

Although relevant statistical information is not available, the general clinical experience of doctors and social workers points to the fact that 'hundreds of elderly people have reached a degree of senility which, while not advanced enough to warrant admission to a mental hospital, nevertheless complicates adjustment and creates many difficulties for members of the family concerned.

The signs of incipient senility are as follows: There is evidence of impairment of memory and narrowing of interests. Insomnia and restlessness lead to aimless wandering during the day and even at night. Impairment of memory, characterized by forgetfulness and disregard of ordinary daily duties, cause irritability and temper tantrums. Emotional instability sometimes develops into active aggression and distrust. There is a distinct blunting of sensitivity. Slovenliness becomes noticeable and personal hygiene is neglected. The problem of caring for elderly persons with

senile tendencies is further aggravated by the fact that the modern community has to a large extent become an urban community. The presence of aged senile relatives in the home or flat often causes maladjustment in the family and in some cases the influence of such persons on children (of all ages) is definitely pernicious. Yet these elderly persons need proper care and are, moreover, entitled to it.

The care of the elderly person with symptoms of early senility thus presents a problem which should be approached with understanding and foresight. One practicable solution is the establishment of special institutions for aged senile persons. The first institution specially intended for aged senile persons to be established in South Africa was officially opened in Pretoria recently. This institution, called the Van Rensburg Monument Home, was specially designed by the architect to meet the needs and requirements of the senile person. There are, for instance, specially designed bathrooms and toilet-rooms with floors on which the inhabitants cannot slip. The corridors, doors and porches are specially wide. It is sincerely hoped that the exemplary undertaking of a Transvaal women's organization (Die Suid-Afrikaanse Vrouefederasie), who established this home, will inspire other welfare organizations to follow their lead.

Another practicable method of approach would be the development of supervisory and advisory services by teams of visiting social workers. The expense attached to such a system of social services may sound high, but measured in terms of the ultimate benefit to society there is no doubt that this would be money well spent.

The steadily increasing longevity of the average person today and the attending circumstances to which this situation has led, present a challenge which we as a society of doctors and lay persons must face with resourcefulness and imagination. Once again preventive medicine is called upon to play a decisive role in a sympathetic and courageous approach to the problem of community planning.

1. Van die Redaksie (1958): *S. Afr. Med. J.*, 32, 632.

2. *Idem* (1959): *Ibid.*, 33, 575.

3. Lewis, A. J. (1946): *J. Ment. Sci.*, 92, 150.

4. Pollock, H. M. in Kaplan, O. J., ed. (1945): *Mental Disorders in Later Life*, p. 448. London: Standard University Press.

## OBSTETRICAL COMPLICATIONS IN THE GRANDE MULTIPARA

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All too frequently the impression is held that a primigravida patient will experience a difficult delivery as opposed to the multipara, who has 'done it before'. Pregnancy, however, is one exception where practice does not make perfect. Moreover, the multipara is probably more important to the community; she is the more skilled housekeeper, she is the mother of more children and it may be taken as an axiom that mothers cannot be replaced. When Solomons<sup>1</sup> referred to multiparae as 'dangerous' he was not exaggerating. That is borne out by this study, which is a review of 551 grande multiparous patients, constituting the total number of such patients admitted to the obstetrical units of the University of Cape Town during the year 1958. For this purpose the term 'grande multipara' is defined as a multiparous woman who has had 8 or more viable gestations.

A comparison has been made with the incidence of complications in the remainder of the patients attended to at the

same obstetrical units over the same period of time and under the same obstetrical management, viz. those who have had 7 or less viable gestations.

### ANALYSIS OF CASES

During the year 1958 the total number of deliveries reviewed was 7,684 and, of these, 551 were grande multiparae, which gives an incidence of 7.17%. Of the 551, 74.6% were 'booked' cases, i.e. had received antenatal care at the clinics. However, the antenatal care in some cases was inadequate owing to default on the part of the patients.

Patients attended to included both Whites and non-Whites, the latter being further divided into Malay, Coloured and Bantu. In the studied series the distribution was: Coloured 64%, Malay 16%, Bantu 14%, White 6%. As it is as yet not possible for most non-White maternity patients to be treated in private hospitals, the majority of cases in whom obstetrical

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TABLE I.

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Parity, age distribution and weight distribution are outlined in Table I. The youngest patient in the group was 24 years old,

TABLE I. PARITY AND AGE DISTRIBUTION AND WEIGHT IN 551 GRANDE MULTIPARAE

Age (years)	22-25	26-30	31-35	36-40	41-45	46-50
%	0.2	11.4	28.2	38.1	18.5	3.6
Parity (Number)	8	9	10	11	12	13-19
%	31	23	19	8	8	11
Weight (lb.)	90-100	101-150	151-175	176-200	201-250	251+
%	0.5	45	27	15.5	10.25	1.75

and the oldest 50 years. The highest parity was 19 in a 43-year-old patient. The weights of the patients varied from 90 lb. to 344 lb. (Only 411 of the group had their weights recorded. The others were all admitted as 'emergencies'.)

The significant frequency of the occurrence of complications in grande multiparous patients is shown and compared with the other patients in Table II.

TABLE II. COMPARATIVE STATISTICS OF MATERNAL COMPLICATIONS

	551 Grande Multiparae		7,133 Remaining Patients	
	No.	%	No.	%
Hypertension of unknown aetiology	168	30.5	716	10
Eclampsia	6	1.1	29	0.4
Antepartum haemorrhage				
Abruptio placentae	57	10.3	169	2.3
Placenta praevia	17	3.9	63	0.88
Postpartum haemorrhage	53	9.6	419	5.9
Abnormal presentations				
Breech	44	8	206	2.9
Transverse, face, brow	12	2.2	60	0.8
Twins	22	4	108	1.5
Prolapse of the cord	12	2.2	51	0.71
Caesarean section	48	8.7	372	5.2
Maternal death	1	0.18	3	0.06

#### Hypertension

'Hypertension of unknown aetiology' included all cases whose blood pressure was 140/90 mm. Hg or more, with or without albuminuria. It was not always possible to distinguish a case of pre-eclampsia from one of essential hypertension, and likewise it was not possible to ascertain whether or not a patient with essential hypertension had superimposed pre-eclampsia. There were 2 cases with albuminuria only and 1 with gross oedema only. These were not included in this group. From the raised incidence shown in Table II, it appears that grande multiparity is a factor in the toxemia of late pregnancy. However, it must be borne in mind that pre-existing hypertension occurs more commonly with grande multiparity. Age and obesity as well as parity are probable associated factors in this increased incidence; the correlation is shown in Table III, which demonstrates the steadily in-

TABLE III. TOXAEMIA/HYPERTENSION IN THE 551 GRANDE MULTIPARAE RELATED TO AGE AND WEIGHT

Age (years)	Under 31	31-35	36-40	41+
% Hypertension	19.6	23.1	28.5	48.3
Weight (lb.)	100-150	151-175	176-200	200+
% Hypertension	16.1	29.6	30.6	48

creasing incidence of hypertension as age and weight increase. There were 6 cases of eclampsia in the studied group. Peckham<sup>9</sup> stated that, while pre-eclampsia increased with parity, eclampsia was predominantly a disease of primiparity.

Antepartum haemorrhage. The incidence of abruptio placentae was significantly high in the grande multiparae—10.3% as compared with 2.3% in the remaining group. Of these cases, 35% were associated with toxemia or hypertension and 28% resulted in stillbirth. The only 3 cases in the grande

multiparous series who developed hypofibrinogenemia did so as the result of abruptio placentae. As expected, the incidence of placenta praevia was about 4½ times as great in the grande multiparae as in the remainder. Peckham<sup>9</sup> found that this complication increased directly with parity. Cases included in this group were only those proved on antepartum examination or by Caesarean section to be placenta praevia. The foetal mortality rate here was 25%.

Postpartum haemorrhage. This was defined as 20 oz. or more. Of the 53 cases in the multiparous group, only 5 were caused by retained placenta; 9 followed on a severe accidental antepartum haemorrhage; 21 (or 40%) of the cases occurred in patients with hypertension. There are a number of theories to account for the high incidence of postpartum haemorrhage in grande multiparae, e.g. lack of calcium through frequent child-bearing, causing poor coagulability and poor muscle contractility; impaired action of the myometrium due to aging, scarring and exhaustion; arteriosclerotic changes in the uterine blood vessels, which therefore do not seal off effectively.

Malpresentations. Various authors have shown some differences in the incidence of specific complications. Schram<sup>10</sup> found no increase in malpresentations in his review of grande multiparae. In contrast, Peckham<sup>9</sup> showed that transverse lie was 10 times as common in the para-10 as in the primigravida. In this present series the increase of malpresentations generally was found to be about threefold. Breech presentations in grande multiparae were 8% as compared with 2.9% in the others, while transverse, face and brow presentations taken together were found to be 2.2% as compared with 0.8%. There was no significant increase in the incidence of cases delivered in the occipito-posterior position, which was 3% amongst the grande multiparae and 2.4% amongst the others.

Prolapse of the cord. This was encountered 3 times more frequently in the studied group, which corresponds very closely to the incidence, and increased incidence, of malpresentation. The foetal mortality in the cases with prolapse was 33.3%.

Prolonged labour. The number of previous labours is no absolute indication that the duration will be shorter in a multiparous patient, but there is a trend in that direction. Of the grande multiparae 3% had prolonged labours, i.e. 48 hours or more. An analysis of the duration of labour is given in Table IV. Of the 16 cases of prolonged labour, 10

TABLE IV. DURATION OF LABOUR IN 551 GRANDE MULTIPARAE

Hours	Up to 6	6-12	12-18	18-24	24-48	48+
%	34	29	16	10	8	3

were due to uterine inertia, all with large babies; 3 were due to persistent occipito-posterior positions; 1 was a breech presentation; 1 developed a Couvelaire uterus after abruptio placentae; and 1 had a ruptured uterus with a baby weighing 10 lb. 4 oz. Oxorn<sup>8</sup> found that 10% of grade multiparae had labours lasting longer than 18 hours and this, he says, supports the opinion of Jeffcoate<sup>4</sup> that uterine inertia is mainly a problem of primigravidae.

Ruptured uterus. This is a very real and dangerous complication amongst grande multiparae. There were 5 cases in the series, 4 of whom had Caesarean hysterectomies and 1 was repaired. Of these, 1 was a spontaneous rupture diagnosed as such, one was found coincidentally when a Caesarean section was to be performed for prolonged labour and foetal distress, 1 was found at Caesarean section for disproportion, 1 was a

partial rupture in a case of obstructed labour and failed forceps, 1 was a rupture which occurred during labour following previous Caesarean section. The high incidence of rupture suggests that the uteri of grande multiparae have undergone some changes which predispose them to this accident. Microscopic sections of the uterus show the myometrium largely replaced by hyalinized involuted blood vessels, the myometrium surrounding which contains little elastic tissue.<sup>6</sup> Eastman<sup>3</sup> states that in grande multiparae the myometrium is probably weakened and may be liable to rupture during subsequent pregnancies. There have probably been small tears in the myometrium during previous labours, leaving weak spots. The abnormal stress of labour associated with malpresentations or large babies would appear particularly hazardous.

**Cardiac lesions.** It is interesting to note that there were 10 patients with cardiac lesions in the series. They were delivered of viable infants and were all discharged with no apparent detrimental cardiac effects resulting from pregnancy. Only one patient developed gross cardiac failure before delivery, but after the birth of a 5-lb. live baby her condition improved rapidly. This, however, is not stated in order to encourage grande multiparity in cardiac patients!

#### OPERATIVE INTERFERENCE

##### Forceps

The small number of forceps deliveries was remarkable. These comprised only 2% of the studied group, whereas of the comparison group they comprised 5.2%. Of the latter, 65% were primiparous patients. From the figures it appears that when obstetrical surgery is required in grande multiparae it is of a major type.

##### Caesarean Section

The incidence of Caesarean section was high; amongst the grande multiparae it was 8.7%, the comparison group showing an incidence of 5.2%. The following is a list of indications:

	Cases
Placenta praevia .. .. .	15
Cephalo-pelvic disproportion .. .. .	11
Toxaemia .. .. .	6
Previous Caesarean section .. .. .	4
Diabetes .. .. .	3
Incoordinate uterine action .. .. .	2
Malpresentation .. .. .	2
Prolapse of the cord .. .. .	2
Abruptio placentae .. .. .	1
Foetal distress .. .. .	1
Previous colpoperineorrhaphy with amputation of the cervix .. .. .	1

Only one classical section was done, the rest being lower-uterine-segment operations. Excluding the repeat sections the incidence was 8%. It is interesting to note how multiparity is no guarantee against disproportion, as shown by the 11 sections performed for this reason. Skill is required for suspecting and diagnosing disproportion in grande multiparae. Any variation from the normal should be regarded with adequate suspicion. Previous Caesarean operations had been performed in 13 cases, in only 4 of which it was necessary to repeat the operation. The incidence of Caesarean section found by other authors varies somewhat. Barnes<sup>1</sup> reported one of the highest rates, viz. 6.2%. Peckham<sup>9</sup> found that operative deliveries were highest in primigravidae; thereafter

the incidence decreased to a minimum in para-4 and -5, whence it rose once more but, he says, never as high again as in primigravidae.

**Caesarean hysterectomy** was performed in 6 cases, the indications being as follows:

	Cases
Ruptured uterus .. .. .	4 (see above)
Couvleaire uterus .. .. .	1
Placenta accreta in the presence of pre-eclampsia .. .. .	1

#### MATERNAL MORTALITY

Only one maternal death occurred in this series of studied grande multiparae—an incidence of 0.18%. The corresponding incidence in the comparison group was 0.06%. Figures given by various authors differ. Nelson and Sandmeyer<sup>7</sup> found a maternal mortality of 0.1%, Miller<sup>6</sup> 0.17%, Schram<sup>10</sup> 0.2%, Eastman<sup>3</sup> 0.42%, Peckham<sup>9</sup> 0.42%, Krebs<sup>5</sup> 0.68%, Oxorn<sup>8</sup> 0.9%. Eastman<sup>3</sup> found that in para 1-5 the mortality ranged from 0.35%-0.37% but rose to 1.17% in para-9. The effect of increasing parity on maternal mortality rises abruptly from the 8th parity.

Table V shows an analysis of maternal mortality related to age and parity as shown in statistics of 1940.<sup>12</sup>

TABLE V. MATERNAL DEATH RATE PER 10,000 DELIVERIES BY AGE AND PARITY \*

	Under 20	20-24	25-29	30-34	35-39	40+	Total
Para 8+	..	..	48.1	42.5	59.3	62.9	55.1
Para 2-7	..	9.5	11.0	21.3	26.5	44.4	25.9
Para 1	..	16.8	21.4	27.2	57.1	95.3	174.3

\* Adapted from Yerushalmy *et al.*<sup>12</sup> and based on 255,727 deliveries.

Oxorn,<sup>8</sup> following the maternal death rate in grande multiparae, noted the marked reduction in incidence during the years 1943-1952. This he attributed to better antenatal care, the use of antibiotics, and the availability of blood for transfusion.

#### FOETAL STATISTICS

**Large babies.** Nelson and Sandmeyer<sup>7</sup> found a significant increase in the proportion of large babies amongst those born of grande multiparae. This finding is confirmed in Table VI, which shows an analysis of infant weights in the present studied group. A similar analysis in the comparison group was not done.

TABLE VI. WEIGHT DISTRIBUTION OF INFANTS OF GRANDE MULTIPAROUS MOTHERS

Weight (lb.)	Under 5½	5½-8	8-10	10+
%	16	54	26	4

**Prematurity.** There was an incidence of 16% in the studied group as compared with 8.4% in the others—a significant increase.

**Stillbirths.** The stillbirth rate in the grande multiparous group was markedly higher, viz. 7.9% as compared with 2.9% in the others. These figures conform with those of Eastman,<sup>3</sup> who found the stillbirth rate with the 9th pregnancy and above to be more than twice that in the lower pregnancy brackets. The likelihood of neonatal deaths with the 9th confinement and later is also substantially greater than with any previous one.

#### CONCLUSION

The grande multipara is frequently an obese, overtired, hypertensive woman who has borne more than her fair share



of children and their burdens. Because of the dangers she faces, Matthews G. Duncan in 1865 stated that such a woman may become a threat to herself and her unborn child. She is older than her sister who has borne but one or two children and apart from her pregnancies she also suffers the infirmities of her age. The greatest care is required in attending such a patient. The sense of false security into which both the patient and the doctor may so easily be lulled is great. It is most important that the accoucheur should recognize the potential hazards in these cases and deal with them with the alertness and judgment they demand. Delivery should be undertaken in a hospital. After regular antenatal care the patient should be told to come in to hospital immediately labour begins so as to give the accoucheur ample time for final assessment. Treatment of hypertension should be active and prompt. Haemorrhage in these patients should be treated vigorously long before there is any deterioration in condition, for they are unable to combat shock well. For this reason it is advisable to treat antenatal anaemia when it is first detected so that the patient may be as fit as possible by the time she is due for delivery. Should disproportion be diagnosed, it is probably far less hazardous to subject the patient to a Caesarean section than to adopt an expectant approach which might result in a ruptured uterus.

Grande multiparae should receive special instruction about contraception; in fact Eastman<sup>2</sup> goes a stage further when, because of the high maternal and foetal mortality and the social importance of the mother of a large family, he even advises sterilization. However, George and Power<sup>3</sup> do not

accept grande multiparity as an indication for such a radical procedure.

More important is the need for every obstetrician to realize that the grande multipara is not an easy patient, and that thorough understanding, alertness and judgment on his part will make the fate of these patients far happier and less hazardous.

#### SUMMARY

A series of 551 cases of grande multiparity has been reviewed. The comparative incidence of obstetrical complications has been quoted and the increased maternal and foetal hazards studied. The total incidence of complications is considerably higher than in patients of lower parity.

No details of treatment have been given but broad principles in the care of such patients have been suggested.

I should like to express my appreciation to Prof. James T. Louw for his help and to Dr. F. Benjamin for his advice in preparing this article.

#### REFERENCES

1. Barnes, T. (1953): *Edin. Med. J.*, **60**, 28.
2. Eastman, N. J. (1940): *N.Y. Med. J.*, **40**, 1708.
3. George, J. M. and Power, H. A. (1949): *Amer. J. Obstet. Gynec.*, **57**, 972.
4. Jeffcoat, T. N. A. (1952): *Surg. Gynec. Obstet.*, **95**, 257.
5. Krebs, J. M. (1956): *Obstet. and Gynec.*, **7**, 433.
6. Miller, E. (1954): *Ibid.*, **4**, 418.
7. Nelson, J. H. and Sandmeyer, N. W. (1958): *Amer. J. Obstet. Gynec.*, **75**, 1262.
8. Oxorn, H. (1955): *Obstet. and Gynec.*, **5**, 150.
9. Peckham, C. H. (1933): *Bull. Johns Hopk. Hosp.*, **52**, 325.
10. Schram, E. L. R. (1954): *Amer. J. Obst. Gynec.*, **67**, 253.
11. Solomons, B. (1934): *Lancet*, **2**, 8.
12. Yerushalmy, J., Palmer, C. E. E. and Kramer, M. (1940): *Publ. Hlth Rep. (Wash.)*, **55**, 1195.

## SCLEROMYXOEDEMA

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Scleromyxoedema (Arndt-Gottron) is a clinical and histological entity which has been brought into prominence lately.<sup>1-3,7</sup> It is not considered to have any connection with thyroid disease or scleroderma, and the name should therefore not call up any such associations. It is closely related to, and possibly identical with, conditions variously called papular mucinosis, lichen myxoedematosus, and lichen fibromucinoidosus.<sup>8</sup> Possibly some eruptive collagenomas properly belong here. An obscure cerebral disorder was noted in our patient, which may have some pathogenetic significance, particularly since marked cerebral and psychological symptoms have been noted before by others.<sup>2-4</sup>

#### CASE REPORT

A married housewife of 64 was seen in December 1958 for a disfiguring swelling of the face and extensor surfaces of the forearms which had lasted for the preceding 4 months. It began while she was convalescing from an obscure cerebral disorder which may have been an encephalitis. It started with a cold and severe headache, followed by maniacal confusion and coma. No vascular cause could be established for it at the time. The patient recovered in a few days from the coma and later seemed normal but for a little residual incoordination in the right hand.

The skin changes began with attacks of swelling on the face and forearms, which subsided only partially between the acute phases. The residual skin thickening became darker and scaly on its surface and showed temporary scarlatiniform and urticarial flushing in the acute episodes. The swellings were provoked by heat but not by light, and the skin stiffness was marked in the mornings, when she would try to massage some of it away. There were no other symptoms. At first she also had some similar swellings round the waist and on the ears and gums but these did not last long. The legs

were unaffected until the skin changes had been established for about 8 months, and then the anterolateral surfaces of the calves became diffusely involved. Some loss of hair was also noted.

When the patient was first seen the forearms, particularly on the extensor surfaces near the elbow, were brownish and leathery and would only fold in big folds with no smaller wrinkles (Fig. 2). Towards the flexor aspect they were less leathery and the infiltration faded into a fine colourless micropapular fixed eruption (Fig. 3) with a linear or moniliform arrangement in some of the groups of micropapules. The facial skin (Fig. 1) showed a similar parchmenty surface with palpable thickening, and some transient reddish 'angioneurotic' swelling of the upper lip. Elsewhere the skin was normal. There was no evident loss of hair.

General examination showed a hypertension with no tachycardia, a left axis deviation, and no demonstrable renal disorder. There was a pea-sized nodule attached to the thyroid, but thought to be separate from it. It has not been explored as yet. A tracer dose of radio-active iodine showed a hyperthyroidism on one test alone. The basal metabolic was +5, and the protein-bound iodine test gave 6.9 µg %. Blood cholesterol, twice determined, was in the region of 300 mg. %. The total blood proteins were 6 g. % (albumin 38.5%, α<sub>1</sub>-globulin 7.7%, α<sub>2</sub>-globulin 11.0%, β-globulin 14.3%, γ-globulin 28.5%).

The histological material comprised 4 biopsy specimens fixed in formalin, from the diffuse and papular lesions of the forearms. Sections were stained with H and E, toluidin blue, thionin, PAS, Hale's iron technique, mucicarmine, silver for reticulin, elastic, PAH and trichrome. The epidermis showed marked pigment increase in the basal layer, some effacement of the papillae, no atrophy, a little intracellular vacuolation, and a thick stratum corneum. The dermis (Fig. 4) showed all the important changes in its outer half, viz. a loose oedematous and fibrillar thickening in the isolated lesions and a denser thickening in the more diffusely thickened areas. The papular lesions consisted of a fine-spun collagen meshwork arranged in whorls and criss-cross patterns. The some-



Fig. 1. Scleromyxoedema (female aged 64). Whole face thickened and leathery, with accentuated pleating round mouth.

Fig. 2. Scleromyxoedema. Portion of forearm skin showing thick loose folds in infiltrated area. Skin dark and scaling.

what larger collagen bundles between this meshwork showed irregular staining, with many pale, shredded, amorphous and foggy bundles. Thick collagen bundles tended to show fewer of these changes and stained in a normal way throughout. In the fine meshwork, fibroblasts were plentiful, and some of these showed a hazy cloud of faintly basophil material around them merging with the collagen. Pericapillary spaces were enlarged and showed an increase of adventitial, fibroblast and lymphocyte cell types. These pericapillary cells often showed vacuoles which indented the nuclei but no stainable material was contained in them. Mast cells were present, but in the minority compared with the fibroblasts. Elastic was present, but degenerated and somewhat reduced in amount. The pericapillary and intercollagenous interstitial spaces (Fig. 5) were partly empty, being created to some extent by tissue shrinkage but probably also by interstitial fluids which were lost in fixation and processing. These spaces were filled by material of a



Fig. 3. Scleromyxoedema. Moniliform and reticulated arrangement of colourless micropapules on flexor aspect of forearm.

mixed and uncertain type. Granular, fibrillar, filamentous and cloudy membranous structures were seen, which merged variably with the surrounding fibroblast cells and dermis fibres. Some fibrils, but not all, stained like reticulin. Some of the material could have consisted of small collagen fibres staining atypically. Elastic was absent. There was streaky and granular Schiff positivity with PAS staining in the interstitial areas. Very mild metachromasia was noted, and mucicarmin stains showed nothing definite. Hale's dialysed iron technique showed blue fibril staining resembling reticulin fibres.

#### DISCUSSION

Keining and Braun-Falco<sup>3</sup> believe that scleromyxoedema represents a strong dermal fibroblastic reaction which progresses only in an imperfect degree to fibrosis, and that the stimulus to it is the abnormal transudation of altered serum proteins into the tissue spaces, where they form a complicated conjugation with a variety of tissue mucins. Their arguments are based mainly on the histochemical behaviour of the mucins

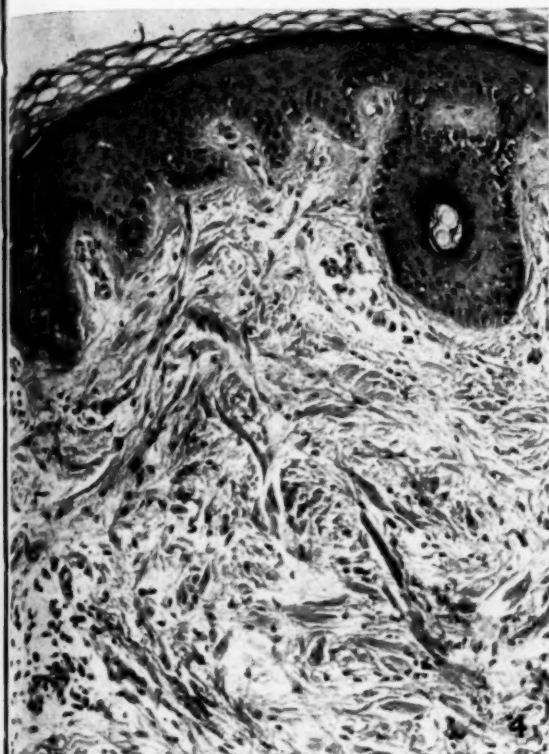


Fig. 4. Scleromyxoedema. Low power of the dermis (see text).

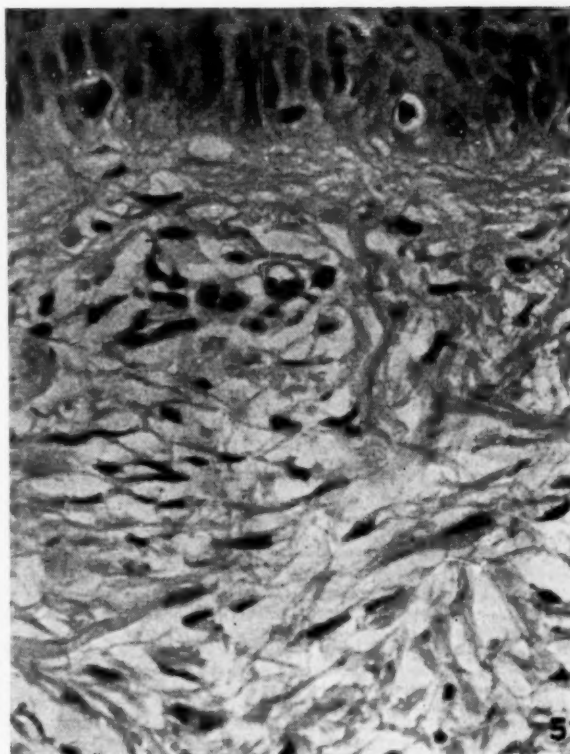


Fig. 5. Detail of the fibrillar and interfibrillar alterations (see text).

in the general clinical setting, and accord well with our histological evidence.

However, the lack of abundant stainable mucin in our case presents an obstacle. Three factors may contribute, viz. formalin fixation, random and uncontrollable variations in mucin staining reactions, and a genuine lack of mucins. In this connection, 2 recent publications report cases which are typical of scleromyxoedema in all respects apparently, but their authors attach entirely different interpretations to the changes, and the resemblances to scleromyxoedema have evidently escaped them. Thiers *et al.*<sup>6</sup> stress the cellular proliferation of fibroblasts with inhibited formation of reticulin and collagen, an increase of elastoid (orcein-staining) material and increase also of an interstitial granular basophilic material. Nicolau and Balus<sup>8</sup> emphasize the reticular to fibroblast increase and the connective-tissue degeneration. The former authors call the disease a fibro-elastoidosis and the latter a benign reticular-fibroblastic cutaneous reticulosis. Difficulties with mucin demonstration have been indicated recently<sup>5,9</sup> in this disorder. They recall the description by Dubreuilh in 1906 of this disease as miliary fibromas with subsequent scleroderma (quoted<sup>2</sup>).

The remaining feature worth discussing is the clear relation in our case between a cerebral attack and the onset of symptoms. Although our patient was psychologically normal,

apart from a poor memory, in the only published autopsy in scleromyxoedema<sup>4</sup> focal demyelination and gliosis were reported in the brain. Nevertheless, we have no evidence of how the brain disorder, whatever its nature may be, could be related to scleromyxoedema. There is no evidence that it is due to a primary cerebral vascular disease with mucin deposits in the vessels, nor is there any indication as yet of a hypophyseal-hypothalamic mechanism.

#### SUMMARY

A typical case of scleromyxoedema (Arndt-Gottron) is described. Theories on the pathogenesis have been noted, even where the disease has been misdiagnosed, and the significance of organic cerebral disorder in this disease is indicated. In the case presented, the fibroblastic and connective-tissue alterations were more prominent than alterations in the mucin content of the skin.

#### REFERENCES

1. Bazex, A., Dupré, A. and Bessières, L. (1958): Bull. Soc. franç. Derm. Syph., 65, 43.
2. Gottron, H. A. (1954): Arch. klin. exp. Derm., 199, 71.
3. Keining, E. and Braun-Falco, O. (1956): Acta derm.-venereol., 36, 37.
4. McCuiston, C. H. and Schoch, E. P. (1956): A.M.A. Arch. Derm., 74, 259.
5. Montgomery, H. and Underwood, L. J. (1953): J. Invest. Derm., 20, 213.
6. Thiers, H., Bondet, P., Colomb, D., Fayolle, J. and Prunieras, M. (1957): Bull. Soc. franç. Derm. Syph., 64, 46.
7. Tappeiner, J. (1955): Arch. klin. exp. Derm., 201, 160.
8. Nicolau, S. G. and Balus, L. (1958): Ann. Derm. Syph. (Paris), 85, 146.
9. Zakon, S. J., Johnson, H. and Grinvalsky, H. (1959): A.M.A. Arch. Derm., 79, 519.



## NUTRITION AND THE FUTURE\*

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Many speakers on this subject retail the abysmal gaps in our knowledge in the past, the tremendous advances that have been made since then, and the optimistic future when all will be known and all understood. It is true that the advances made over the past 35 years have been considerable. We now know a great deal about the role of vitamins in enzyme systems, the part proteins play in the animal economy, and the importance of the mineral elements. When I was a student, Sir Frederick Hopkins used to devote one lecture to the vitamins and it was not a very long lecture. When I was working in Sir Rudolf Peter's laboratory at Oxford, I used to admire his persistence and wonder if ever vitamin B<sub>12</sub> would be isolated from the awful brew of autolysed yeast he began with. Such authorities and many other scientists worked away unheralded till about 1936, when what was called the Newer Knowledge of Nutrition was born. Why it was called *newer* I never discovered, since the old problems were still with us. However, at that time a spate of popular literature fell upon the public, and nutrition became the latest band-wagon to catch. It was unfortunate that at this time Sir John Orr, as he then was, published a valuable work, *Food, Health and Income*,<sup>1</sup> for this gave the purveyors of nutrition much fuel, and the popular press in Great Britain stated that one-third of the population was starving, which was the last thing Sir John meant to say. I do not wish it to be thought that this movement was altogether bad—the public conscience was drawn to the tremendous amount of malnutrition that did exist in various parts of the world, and from this sprang FAO and other organizations devoted to improving the nutritional status of under-developed peoples.

The great trouble at that time was our complete ignorance of dietary requirements and of the effect of lack in humans of specific nutrients. From this ignorance arose the belief, fostered by Lady Mellanby, that vitamin D was the cure for dental caries, by Lucius Nicholls that vitamin A was one of the specifics for neurological diseases, that vitamin E would cure sterility, and that large amounts of calcium were vital for the growth of schoolchildren. These beliefs all failed. As a result the Newer Knowledge of Nutrition gradually simmered down into the age-long ignorance of nutrition which had been always with us. Great technological advances were made during the war years, and methods of food preservation and desiccation, which conserved the value of various articles of diet, were successfully introduced. It was inevitable that, during a time of emergency, research into nutrition should take such a course, but it was not very fundamental to an advance in this field.

I cannot but feel that we nutritionists have manoeuvred ourselves into rather an invidious position. With our boasting about the Newer Knowledge of Nutrition it is true that we have awakened the public to the importance of this subject, but with the result that well-fed or overfed people take large amounts of vitamin preparations or of various patent foods, and read certain books which advocate dietary practices which all of us here feel dubious about.

In spite of all this, no class of society, of any economic status, or anywhere in the world, can be guaranteed to be properly nourished. This may be due to ignorance, bad feeding habits, greed, or poverty. The rich may eat too much fat, or the wrong type of fat, as well as too many calories, which can harm their hearts and put up their weights; their children may eat cariogenic diets; poorer people may eat too much carbohydrate, and the economically under-privileged have diets low in protein and protective foods. When I was at the Rowett Research Institute, a centre staffed with nutritional experts, I noticed that even many of them ate very queer diets and had ulcers.

Since the late 30s the responsibilities of nutrition have expanded to cover far more than merely what we eat and why. Food production and distribution, newer and better methods of crop cultivation, population increase, even atomic power, now lie in the confines of nutrition. For the last decade these problems have been creeping up on us, but I know of hardly any concrete proposal for their solution, and now they are staring us in the face.

I have called this talk *Nutrition and the Future*, but I might as well have called it the *Challenge to Nutrition*, or *No Cause for Complacency in Nutrition*.

\* Presidential address delivered at the Annual General Meeting of the Nutrition Society of Southern Africa, 26 November 1958.

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## POPULATION GROWTH AND FOOD PRODUCTION

## Population Growth

Malthus many years ago promulgated a 'law of population', that the number of persons tends to grow faster than the food supply, and he suggested various 'positive' and 'preventive' checks as the only way this could be controlled—'positive', by such things as war, disease and famine, 'preventive', a restriction in the growth of the population. Recently Julian Huxley<sup>2</sup> has commented on the sudden increase in the population of the world as an explosive process, and without example in history. Prof. K. Davis, of the UN Population Commission, has stated: 'This explosive human multiplication cannot continue indefinitely. How this growth is eventually stopped, and when, will play a tremendous role in human destiny'.

The dietary problems this state of affairs has created have led to several thoughtful articles. Harrar<sup>3</sup> has analysed the position and comes to a hopeful conclusion, but the solution is entirely in our own hands. I remember Sir Stanley Davidson saying to me several years ago that in his opinion the scientific aspects of nutrition had been solved, and that the problem now boiled down to distribution and economic aspects. The following facts show that this assessment of the position is indeed wide of the mark, and would still be so even if everybody could afford to buy all the food he wanted.

In 1700 the world population was 500 million, in 1900 1.25 thousand million, and in 1950 2.5 thousand million. It will probably double over the next 40 years and by 2050, if the population growth continues at the present rate, it will be nearly 13 thousand million. At this rate of expansion, the outlook is indeed frightening, since the increase in food production in the world is not at present even 2% per year. One group of scientists seems to regard the future as chaos, and presumably expect that some catastrophe will drastically reduce the population. Others hope that a solution will be found, and not far off, whereby food production can be increased by improvements in technology and similar means.

## World Food Production

Even at present food production is inadequate and does not amount to 3,000 calories on an average per head per day. Harrar estimates that only 25% of the world population get more than 2,750 Cals., while 55% get less than 2,200 Cals. per day. The way things are going, those with the highest standards of living will probably find themselves in a situation when the luxuries of 1940 and 1950 are sad memories. This will not benefit anyone—the decrease in living standards of this group merely representing a contribution to the increased number of people in the world, the rich getting poorer, and the poorer, poorer still. I do not want to deal with the question of population control but, as can readily be seen, it is a fundamental problem in our survival.

There are a number of factors aggravating this food shortage, some of which we could improve. One is the difference in efficiency in different countries, due to natural barriers to efficient crop production, public-health difficulties, poor natural resources and education. What can happen when these difficulties are overcome has been shown by the Mexican Agricultural Program.<sup>4</sup> This was undertaken jointly by the Mexican Ministry of Agriculture and the Rockefeller Foundation, and as a result wheat production in certain areas has been increased to a phenomenal degree, and as a by-product an excellent group of young Mexican agronomists has been produced. Using mechanization in the USA, 2-4 man-days are needed to produce rice at a rate of 3,500 lb./acre, but in certain backward rice-growing areas of the world, 400 man-days are needed to produce 700 lb. or less per acre.

As will be admitted by all South Africans, the use of the soil has been in the past little short of disastrous, and all over the world millions of acres have been rendered useless, or will take a long time to recover. It seems that we shall never have more than 4 thousand million acres on crop production, and erosion is still reducing this acreage. Besides this, the use of land for other purposes, urban and industrial, is eating away the available land, with no substitution. One cannot but hope that in many parts of

the world, especially Africa, land now dormant will be used, but we do not want a repetition of the ill-fated ground-nut scheme.

As far as water is concerned, it is obvious that as long as the farmer is at the mercy of the rainfall, he will be quite unable to predict success or failure in his crop. Irrigation schemes have proved the solution throughout the world, as well as in the Union. I always think it is tragic, when travelling through the Karroo, to see the little areas round railway stations, where there are boreholes, and where crop production is most successful, while the rest, although potentially very fertile, is a desert for lack of water. It is clear that if irrigation could be extended, enormous areas would be available for food production.

One could go on enumerating many other factors responsible for poor crop production—parasites, unequal distribution of mineral resources, and the type of agricultural worker. People working on the land should be well fed and healthy, but it too often happens that in the most backward countries, whose production is already inefficient, the workers are half starved, thus worsening the problem.

When the quantitative aspect of what happens to our food production is considered, several interesting points emerge. The limiting factor is the capacity of the soil to produce carbon compounds. On this basis the total crop production could theoretically support far more people than now live in the world. But about half is eaten by animals and only 3–5% of this is available again for human food. Only about 20% of the other half is at present used by us as food, and this makes no allowances for storms, droughts and other disasters, which always reduce this figure to a level where there is never enough.

In an interesting article entitled 'Science and Human Want', Clapp<sup>1</sup> goes, among other things, into the question of mechanization in farming practice. In the USA, in 1860 a farm produced enough food for 5 other people, in 1940 for 11 others, and in 1956 for 20 others. This great increase in production is mainly due to mechanization. Farming is now a big business in America, as shown by the fact that 80% of farm products come from 20% of the farms, and 1/3rd of the doubled farm production in the last 40 years is due to an increased use of mechanization. In the future, however, increases in production will be due less and less to mechanization, which seems to be reaching its peak. Thus we cannot expect much more increase in production from this source.

There are still two relatively untapped sources of food. One is the sea, and the other non-cultivated land. Between them they produce annually more than 150 thousand million tons of carbon compounds. As regards the sea, it is clear from our experience in South Africa that, provided it is wisely carried out, far more could be harvested from the sea than is done at present. For non-cultivated land, I am a little wary of the validity of such figures as those quoted above. Land must be used for grazing, since we shall always need animal food. Furthermore we need forests not only to provide fuel and building material, but also to protect the soil. One can instance New Zealand, where the indigenous bush was indiscriminately burnt by the early settlers to the great detriment of the soil.

For these reasons I do not see, except in completely undeveloped parts of the world, a great increase in the areas at present under cultivation. We must in the meantime improve the plants we have and the soil we cultivate.

#### Possible Solutions

Only about 1% of the 300,000 plant species so far described have ever been used for food, only 300 are now at all widely grown, and a bare dozen provide the world with 90% of its food supply. Presumably experience has taught our forebears that these dozen are the best for the purpose, but we know now that a wide possibility exists for the geneticist and plant breeder to produce plants with a better yield and greater robustness against weather and disease.

We seem to be very timid in experimenting with new food. Seaweed is known to be nutritious, in some areas it is still eaten,<sup>2</sup> and attempts have been made to develop its use in South Africa. An alga, chlorella, if fed with ammonium salts, will produce up to 500% of its original weight in protein. It can be grown in water at a rate of 27.5 tons per acre of surface—a far higher yield than that of soya beans, the most productive crop now grown. It remains to be seen if such a protein source is nutritionally useful.

As far as our soil is concerned, great advances have been made over recent years, especially in changing its chemical and biological

properties to meet various conditions at critical periods to improve crop production. Even the humble gardener knows how to manipulate his soil to alter the colour of his hydrangeas. The carrying ability of agricultural soils has been increased to an amazing degree. In addition, the microbiology of the soil, which seems to have been largely neglected, is now becoming as complete a science as the microbiology of animals. The flora of the soil plays an important role in the decomposition of crop residues, in making available nitrogen and phosphorus, and in regulating the pH.

There is an aspect of this that has always interested me, viz. the apparent complete waste of drainage, which ought to be immediately available, with a rich content of nitrogen, phosphorus and other nutrients. I calculate that Johannesburg, with a population of 800,000, produces 25 tons of urea per day. An accountant accustomed to balancing credit and debit would be horrified to see such rich assets thrown away. I suppose that wiser heads than mine have gone into this matter, but it would appear on the face of it that a much more widespread use of sewage farms would give us a rich source of vegetables at a trifling cost. During the war farm animals were fed with urea as a partial source of nitrogen, and I see recently that it has been claimed that urea may furnish as much as 1/3rd of the protein needs of cattle, and that corn cobs and other roughage may be used with urea as a source of carbohydrate.

The use of fertilizers has undoubtedly done as much as mechanization to increase crop yields. The experiments at the Morrow Plots at the University of Illinois are illustrative of the value of fertilizers. These plots had been put under maize every year since 1876 without the addition of any plant food. In 1955, full fertilization treatment brought up the yield to the same value as that of rotation plots which had been fertilized every year since 1904. As an onlooker on such procedures, it does seem to me that this aspect of modern agricultural practice is reducing the soil to the level of a vehicle like water in hydroponics—to hold up the plant and act as a sponge to absorb water and the various chemicals poured on to it but, other than this passive role, to have no value. With such intensive methods, the nutrients originally in the soil have presumably long since gone. While this appears inevitable with our modern methods and way of life, heaven help us if the supply of fertilizers fails!

Apart from the use of fertilizers, a number of plant protectors and stimulants are coming into use. Some seem to play a role like antibiotics in animal husbandry. Such substances as gibberellin, various hormones and other organic compounds are being more frequently used. Food preservation and transport, too, have made great advances, and it is possible to eat almost anything nowadays, whether it is in season or not. Unfortunately the cost of these articles puts them outside the pocket of many classes of people and frozen foods rank as luxury items. On a wider scale, however, surpluses of food can now be preserved and need not be wasted. One would hope that such surpluses would mean a more equitable distribution of food throughout the world, but so far this has happened only to a small degree. Lord Boyd-Orr once said that he was convinced that free gifts of food to Germany in the early 1930s from nations able to afford them might have averted the Nazi domination.

The supplementation of foods has been one way in which the diet of the under-privileged has been improved. In some countries this procedure has gone quite mad and a lot of waste has resulted. The cotton-wool which passes for bread in America is doubtless packed with good things, but who wants to eat it? In South Africa a courageous start was made with the addition of various nutrients to bread. However, it is unfortunate that no attempt, as far as I know, was made to find out what was lacking in the diet of the population before the additions were made. Nor have I seen any figures indicating that eating this bread has improved or in any way affected the health of the population, and especially that of the less privileged section. If indeed this information is not available, a valuable natural experiment has been allowed to fall by default, and it would appear difficult for nutritionists to justify the considerable expenditure which must have been involved. I do not think that enrichment of foods is more than a temporary expedient in solving this question. It implies a permanent source of the nutrient added, and also enforces on the population as a whole extra nutrients which many of them may not need.

I feel that no reference to these problems would be complete without mentioning sources of energy and their possible application. I am thinking of cheaper manufacture of fertilizers, possibly

the conversion of sea water into fresh water and its transport to distant areas, cheaper power for use on farms, and factories for processing food. Coal and petroleum products have been exploited by us to as full an extent as will ever be achieved, and they will in the end be exhausted, but the new possibilities released by nuclear power, if they are as promising as they sound, and if we do not let the misuse of them destroy us, should solve many of our problems. But by the time this consummation has arrived we shall be living in the completely artificial world from which there is now no escape—an artificial soil, enriched by artificial fertilizers, pepped-up plants, controlled water supply, and energy from a source which can only be described as 'unnatural'. A breakdown in any of these—and they all seem to me to be unreliable to some extent—would mean a catastrophic disaster which would wipe out the majority of mankind. Life on the moon might seem no more hazardous, and possibly one solution will be space immigration!

One final point before I leave this aspect. Even if we can produce enough food to feed everybody properly, some economical readjustment must take place whereby everybody can buy or be supplied with what he needs.

#### DIET AND HEALTH

Before blithely planning that everyone should have enough to eat, we must consider very carefully what this should be. I suppose we consider that the Western form of diet is the best, and presumably wish to elevate the under-privileged elsewhere to a diet of that type. However it is becoming abundantly clear that the Western type of diet is killing off more and more people from coronary heart disease, and also that it is very bad for the teeth. I do not need to discuss coronary arterial disease here, but I should like to draw attention to some war-time studies which from the nutritional point of view are interesting and apparently show that these two processes are reversible.

Biörck<sup>7</sup> has given an analysis of the incidence of arteriosclerotic heart disease in Scandinavia before, during and after World War II. Owing to enemy occupation, or to rationing, the consumption of fat fell very considerably in Norway and Denmark. It was also reduced in Finland and to a lesser degree in Sweden. This was accompanied by a reduction in the total death rate in Finland, Sweden and Norway, but not in Denmark. Denmark usually exports butter and eggs in large amounts and, since this was no longer possible, the consumption of eggs and much more so of butter increased considerably. The inference was drawn that the change in food habits was one of the factors responsible for the fall in death rate, and evidence from other sources supports the concept that the reduction in fat intake was responsible. One fact that Biörck points out was the intimate connection between the fat consumption decrease and the decline in mortality from arteriosclerosis, there being practically no time lag. With the end of the war the diet 'improved' both in calories and fat content, and the death rate immediately rose again in Norway, Sweden and Denmark. In Sweden the percentage of fat per total calories rose from 33.5 in 1948 to 36.6 in 1953.

The other condition which improved greatly during the occupation was dental caries. During the war it was found that the incidence of caries in occupied countries fell considerably, though the interpretation of this apparently simple finding has varied considerably. Bransby and Knowles<sup>8</sup> investigated the teeth of children in the Channel Islands just after the German occupation and 2 years later. When the islands were liberated it was found that 51% of the children in the age-group 3—7 were caries-free. A similar group had been taken to England before the German occupation and of these only 11% were free of dental decay. Two years after liberation the teeth in the Channel Islands had deteriorated considerably, while those of the corresponding children in England had not changed to any great extent. After the liberation the chief changes in the diet were: more protein and vitaminized fat; considerable increase in consumption of sugar, jam and sweets; more puddings and made-up dishes; and an increased intake of all nutrients, including vitamins A and D, and of calcium.

The same decrease in caries was found in Norway, but here a dental campaign against the use of excessive carbohydrate, and other dietary reforms, had been in action since 1938. As a result a fall in the caries rate began in that year. This was accelerated during the occupation, when the sugar consumption fell from 87 to 30 g. per day per person and sweets were unobtainable. Collett,<sup>9</sup> who reported these findings, said that the relationship of

caries to food was quite plain, and quoted Goethe: 'It irritates people that truth is so simple'.

In this connection, Sognnaes<sup>10</sup> made an analysis of the timing. The reduction in caries had a definite time lag after the change in diet. He attributed the improvement, not to a change in the oral environment, but to an indirect favourable effect on the development of the teeth. He has produced much other evidence in favour of the thesis that factors operating on the teeth during their development affect their caries resistance.

I have mentioned these two rather different pathologies to show that there is no doubt that a poor diet is not all bad. If we are going indiscriminately to improve the diet of the Bantu here, to bring it into line with our own, shall we then subject them to the danger of cardiovascular disease, from which they are now infrequent sufferers?<sup>11</sup> We already know at the Dental Hospital that the urbanized Bantu has caries which approaches that of the White man in severity.

Here is a tremendous responsibility for nutritionists of the future. Any improvement of the world food supply must avoid the tragic example of the Western world, where we seem to be killing ourselves off with eating. About the only consoling fact is that these conditions appear to be readily checked and are reversible.

#### The Value and the Use of Dietary Standards

I cannot but feel that a lot of our trouble about these problems is our ignorance of dietary standards—how these should be determined and how applied. We cannot estimate a world requirement for food unless our standards are accurate. The experimental method of putting animals on to diets 'adequate' in all respects but one, and then altering the intake of the item under investigation is obviously open to question. In the first place we are not sure of the adequacy of the diet, and secondly, as is well known, the requirement of one nutrient is often tied up with the dietary level of another, as for example, calcium and phosphorus, vitamin B<sub>1</sub> and carbohydrate.

Having served on a committee dealing with dietary standards, I now have much less respect for the figures so authoritatively set out by the official bodies of North America and Europe. During our deliberations, we wrote to some of these people asking for further information on points not clear to us, and found to our surprise that these points were also not clear to them. We felt that the functions of a table of dietary standards could be laid down at most as follows: 'The standards proposed . . . should be regarded as adequate for the maintenance of health without allowing for a safety margin for ill health, or for great individual differences in absorption and metabolism.' Furthermore it is obvious that while every constituent of the diet has a proper level of intake, those listed are only the ones which may be in short supply, such as vitamins, some minerals, protein, etc., the purpose of the table being to ensure that enough of them are provided. There must be standards for the intake of carbohydrate, sodium, potassium, chloride, and so on, but there is usually no danger of shortage of these. For fat, on the other hand, I think the time has come for nutrition councils to be more specific. Unlike the other items listed, here is an example of the danger of over-consumption, and not only the amount but the type of fat should be prescribed. Our Nutrition Council suggested the intake of 20-30% of total calories and the addition of essential fatty acids. This is not at all helpful to the person actually drawing up a diet; the absolute amount of fat to be consumed at various calorie levels, and also the kinds of fat that should or should not be eaten ought to be listed.

The first tables to be officially issued were put out by the League of Nations in 1935. Since then the Food and Nutrition Board of the National Research Council of the USA, the Committee on Nutrition of the BMA, the Dutch Nutrition Council, the Canadian Council on Nutrition, and our own National Nutrition Council, have put out tables. I do not wish to comment on all these findings; they are not strictly comparable, because the underlying philosophies are not the same, but in general they do not differ a great deal.

Calculations about the future of the world food supply depend in large measure on our dietary standards, and it behoves us to study these critically to ensure that our calculations are all right. Seeing that the laws of thermodynamics are also supposed to apply in physiology we can, I think, assume that the calorie levels listed are correct. These figures are amenable to accurate appraisal,



and the effects of excess or deficit are immediately seen. Protein standards seem to be undergoing a change. The report of the FAO committee,<sup>12</sup> though now 3 years old, shows that much constructive thought has been given to the matter. A reference protein (of high biological value) is used as the basis. This puts the matter on a far more quantitative basis than the old pious hope that of the total protein intake 'at least 1/3rd should be of animal origin'. It now appears that our protein requirements were set too high and that some reductions can be made, going back to the standpoint of Chittenden half a century ago. In addition, the important practical aspect of protein mixtures, to give a final satisfactory amino-acid balance, has been stressed. This is a particularly vital point in feeding natives in countries like Africa, where the diet is primitive or unsatisfactory. If our protein requirements have in fact been estimated at too high a figure, this is reassuring for the future, since, as I see it, a world protein shortage is likely to be the most acute problem of the future.

Fat is the most expensive of all foodstuffs. If we can encourage people to eat less fat, so much the better. In fact, from our wartime data, a world shortage of fat in the future would appear to be desirable.

The vitamin recommendations, with the exception of ascorbic acid, are probably of the right order, though recently the American Food and Drug Administration<sup>13</sup> have proposed a daily requirement of 10 mg. of niacin and 1 mg. of riboflavin, a reduction in both cases from previous recommendations. In this connection I should like to emphasize the fine work of Horwitt and his colleagues,<sup>14</sup> who have studied the effects of vitamin deficiencies and of various levels of intakes directly on humans. Their figures for riboflavin and niacin requirements, based on long-term and painstaking experiments, are of the same order as those found in official tables. They are still undecided whether vitamin E plays any role in the economy of the adult.

I should like to mention two other nutrients which figure in nutrition tables. One is ascorbic acid. After the classical work of Fox and Dangerfield in 1940,<sup>15</sup> who showed that Natives on the mines could remain in perfect health on small intakes of this vitamin, and the confirmation of their findings by Bartley *et al.*,<sup>16</sup> it is incredible to me that the National Research Council of the USA still recommend such high figures. The same applies to calcium; the recommendation for this element was at one time 1 g. per day for adults. Hegsted *et al.*,<sup>17</sup> Walker<sup>18</sup> and I<sup>19</sup> have all stressed that in adults the calcium requirement is far lower than this, though I do not go so far as to say there is no requirement—there must be one, however small it is. Probably the only people who need calcium in any amount are children and lactating women. The full-term foetus contains about 25 g. of calcium, and this is not much of a drain on the mother's reserves. For full lactation over 9 months, the mother must produce about 80 g. of calcium, or about 8% of her skeletal reserves, and in spite of extra calcium in the diet she often prefers to use her bone calcium. For children I recommended some years ago<sup>20</sup> that Terroine's method,<sup>21</sup> based on body analysis, should be employed instead of the hit-and-miss metabolic balance methods now current. Calculations based on the available figures of body analysis of children show that their calcium requirement is a good deal less than supposed. Thus here, too, we find that the estimated requirements on which many of our calculations for the future are based are too high. This is a reassuring thought and shows that in this respect the future may not be so gloomy as at first thought.

#### Assessment of Nutritional Status

If we are going to improve the world's diet, we must have some method whereby we can assess nutritional status and observe if our dietary changes have caused any improvement. The clinical evaluation of nutritional status is difficult. Even the rationale of the figures of the Metropolitan Life Insurance Co. of New York for heights and weights does not appear very clear, and I know of no evidence for their being accepted as gospel truth, save the fact that they are statistically built up upon the findings from a large number of apparently normal people.

In the evaluation of bodily composition it is important to have a basis from which to work. This information is being gradually acquired from the analysis of corpses and will form a valuable standard from which to argue.

In living people, however, indirect methods have to be employed, based upon dilution methods and metabolic data. This subject has been recently reviewed.<sup>22</sup> The assessment of muscle mass can be made from estimations of urinary creatinine, but these figures

are not so interesting from the nutritional point of view as those of body fat and water content, since these latter constituents are most easily changed by diet. The methods for evaluating fat and water values must take into account genetic and other factors, since to compare a skinny person with one naturally well covered, without such considerations, would be valueless. One of the most important influences to consider is the endocrine one. For one person a weight of 150 lb. may be normal, for another of the same height it might represent long-standing malnutrition.

Physical anthropologists have gone into the question of body build and have endeavoured to draw up formulae for the proportions of skeleton, muscle, fat, etc. We all know of the 'somatype' classification of Sheldon,<sup>23</sup> but to what extent these various 'morphs' are produced by nutrition is undecided. It seems, however, that nutrition must play a big part, since endomorphs are fat types and ectomorphs are usually skinny. Brozek and Keys,<sup>24</sup> in their well-known starvation studies, found a strong correlation between somatype rating and body density. They consider it possible that this may have eliminated the virtue of the system as providing a permanent (constitutional) index, but the somatype rating may be used instead as a measure of nutritional status.

Experimental work has produced much interesting information. The standard used is the lean body mass, which appears both in animals and man to have a quite uniform composition, with a specific gravity (SG) of 1.100. Thus it should be possible to estimate the amount of body fat from the amount of body water as well as from the SG.

One would have thought that the direct determination of the SG would have been the easiest and most accurate, since we know the SG of the fat-free body. However, the complicated apparatus needed would preclude its use by all but the best-equipped clinics. In addition, errors creep in from the air in the respiratory passages and the lungs, and from any gas in the intestines. In animals the air trapped in their fur introduces a further error. A gas-dilution method has been described which theoretically should be perfect, but the apparatus is very expensive and needs trained technicians to operate it.

However, indirect methods for estimating body composition can be used. As one example of how this can be done one can quote McCance and Widdowson:<sup>25</sup> who measured the extracellular space by the thiocyanate method, corrected for water in the red cells, determined total body water by the urea technique, and calculated the cell mass and fat of the body. The differences between total body water and the volume of extracellular fluid was considered to be cell water, the cells being 67% water by weight. The fat-free body contained 7.5% minerals by weight. The fat was then calculated as the body weight minus the weights of extracellular fluid, cell mass and minerals. Using this method McCance and Widdowson studied various people, including undernourished German prisoners of war. In the latter it was found that while they were of normal weight for their height, part of the weight that would have been interpreted as fat was water. The extracellular fluid volumes are also very high in undernourished children.

An ingenious and simple method for fat assessment, developed by the Minneapolis school, is the measurement of skin folds by special calipers. This method is obviously not particularly accurate, but it has proved useful when working with large groups, where a technique like that of McCance and Widdowson could not be applied.

It would be most helpful if we could have a formula to work out the SG from such parameters as height and weight. Cowgill<sup>26</sup> has produced such a formula, based on weight and height measurements. On applying it to a number of different people it seemed to give results of the right order. As an extreme example, the famous fat man, Daniel Lambert, who weighed 739 lb., had a SG of 0.950, the SG of human fat being 0.92. Newborn babies had calculated fat contents of 12–16%, which agreed well with actual analyses. The data for children varied from specific gravities of 1.10 for tall boys and 1.108 for abnormally thin boys to 1.066 for fat boys. The formula was applied to the prisoners investigated by McCance and Widdowson, and had the limitation of over-estimating the fat in these individuals. As stated above, part of the weight regained was water, not fat. Cowgill comments that it would be interesting to know how long the period of rehabilitation must be in order to restore not only the person's weight, but also the body composition which that weight represented.

We are thus developing useful and accurate methods for the determination of the nutritional status. If we are going to improve the diets of peoples in the future, it is only by methods such as these that we can determine if we have succeeded or not.

#### THE FUTURE

It may appear that I have given a very gloomy prognosis for the future of world nutrition—a rapidly expanding world population, a far too slow development in food production, and a general lowering of standards to ensure our survival.

The answer is an 'artificial' type of life, dependent on many factors which are themselves unreliable. But are we not there now? When the electricity fails in my house, we cannot cook, food deteriorates in the refrigerator, and we have no light, no heat and no radio—what more artificial than that? In nutrition we shall have to rely on fertilizers, mechanized production, irrigation schemes, atomic power; because of the way we have chosen to evolve, such developments are inevitable.

But we can at least exploit the resources which have lain fallow in the world since man began to live in it. All these facilities were there but they were not used. I think the future is one of challenge and promise. We know the problem and we know the answers. With the potentialities that we possess and the techniques now available, it is our responsibility to utilize them to the utmost of our ability and knowledge.

### CANCER: KILLER NUMBER ONE

LOUIS FRANKLIN FREED, M.A. (S.A.), M.D. (RAND), D.PHIL. (PRET.), D.PHIL. (U.O.V.S.), F.R.S.S.Af., Johannesburg

An examination of recent statistical data reveals clearly that before the turn of the present century cancer will become—if other things remain equal—the biggest killer in the communities of the world. It has been estimated that 50,000,000 people in the United States and 4,000,000 people in the Union of South Africa, now alive, will develop cancer in their lifetime. These figures give cause for public alarm and stand as a challenge to our medical science; and if in every latitude the piercing cry is heard, 'What is being done to combat the evil in our midst?' then we would say that the answer is being constantly given by an organization which was founded in South Africa as far back as 1931 by a group of men whose names now belong to medical history, and which included Drs. M. des Ligneris, J. H. Harvey Pirie, E. B. Woolf, D. Horwicz, P. J. Olivier, A. J. Orenstein and A. Mavrogordato, Sir Spenser Lister and Messrs. Hugh R. Solomon and James Pinkerton. The organization formed by these public-spirited men is known as the National Cancer Association of South Africa, and the objects for which it was established are well expressed in its ably drafted memorandum and articles of association.<sup>1</sup> If proof is needed of public confidence in the work of the National Cancer Association, under the presidency of Dr. Lewis S. Robertson, one has only to consider the spontaneous response of the public to appeals for funds.<sup>2</sup>

#### ASSOCIATION'S CONTROL PROGRAMMES

The National Cancer Association of S.A. has only recently inaugurated its control programmes. They include the following:

##### 1. The Provision of Information to Medical Practitioners

(a) *A quarterly scientific journal entitled the 'South African Cancer Bulletin'.* This Journal was initiated in 1957, and copies are circulated free of charge to registered medical practitioners. Its contents include case reports, abstracts, reviews, all of which focus attention on the diagnosis and treatment of cancer.

(b) *Professional films.* The NCASA, with the assistance of the American Cancer Society, has built up a national film library, consisting at present of 28 professional films. Film catalogues are circulated to interested organizations, such as Branches of the Medical Association of South Africa, hospitals and medical schools. Films are loaned free of charge under prescribed conditions.

(c) *Assistance to medical libraries.* The NCASA provides the libraries of medical schools with publications relating to cancer which, owing to lack of funds, they are unable to purchase.

(d) *Grants for post graduate study and research.* The NCASA has made it financially possible for research workers at our medical

- REFERENCES
- Orr, J. B. (1936): *Food, Health and Income*. London: Macmillan.
  - Huxley, J. (1957): *New Bottles for New Wine*, p. 174. London: Chatto and Windus.
  - Harrar, J. G. (1958): *Trans. N. Y. Acad. Sci. Ser. II*, 20, 263.
  - Borlaug, N. E. (1958): *Ibid.*, 20, 278.
  - Clapp, L. B. (1958): *Amer. Sci.*, 46, 176.
  - Irving, J. T. (1953): *Food Industr. S. Afr.*, 6, 33.
  - Bjork, G. in Keys, A. and White, P. D. (1956): *World Trends in Cardiology I. Cardiovascular Epidemiology*, p. 8. New York: Hoeber-Harper.
  - Bransby, E. R. and Knowles, E. M. (1949): *Brit. Dent. J.*, 87, 236.
  - Collett, A. (1946): *Nordisk Med.*, 7 June. Quoted in *Lancet*, 2, 129.
  - Sognnaes, R. F. (1948): *Amer. J. Dis. Child.*, 75, 792.
  - Higginson, J. in Keys and White, *op. cit.*, p. 34.
  - FAO (1957): *Protein Requirements*. Nutritional Studies No. 16. Rome: FAO.
  - National Live Stock and Meat Board, USA (1957): *Bull. No. 2*, Vol. 29, November.
  - Horwicz, M. K. (1955): *Ann. N. Y. Acad. Sci.*, 63, 165.
  - Fox, F. W. and Dangerfield, L. F. (1940): *Proc. Transv. Mine Med. Offrs' Assoc.*, 19, 19.
  - Bartley, W., Krebs, H. A. and O'Brien, J. R. P. (1953): *Spec. Rep. Ser. Med. Res. Coun. (Lond.)*, No. 280.
  - Hegsted, D. M., Moscoso, I. and Callazos, Ch. C. (1952): *J. Nutr.*, 46, 181.
  - Walker, A. R. P. (1958): *Ann. N. Y. Acad. Sci.*, 69, 989.
  - Irving, J. T. (1957): *Calcium Metabolism*. London: Methuen.
  - Idem* (1950): *S. Afr. Med. J.*, 24, 601.
  - Terroine, E. F. (1936): *Quart. Bull. Hlth Org. L.N.*, 5, 427.
  - Cowgill, G. R. (1958): *Borden's Rev. Nutr. Res.*, 19, 1.
  - Sheldon, W. H., Stevens, S. S. and Tucker, W. B. (1940): *The Varieties of Human Physique*. New York: Harper.
  - Brozek, J. and Keys, A. (1952): *Science*, 116, 140.
  - McCance, R. A. and Widdowson, E. M. (1951): *Proc. Roy. Soc. B.*, 138, 115.
  - Cowgill, G. R. (1957): *Amer. J. Clin. Nutr.*, 5, 601.

schools and the South African Institute for Medical Research to conduct investigations into the causation, prevention and treatment of cancer. During the 1958 research grants amounting to a total of £35,000 were made to Drs. J. C. Allan, M. B. Bennett, B. M. Bloomberg, D. Burgun, R. J. W. Burrell, M. M. Dale, G. v. d. W. de Kock, J. H. S. Gear, J. M. Grieve, J. Higginson, S. S. Mirvish, A. G. Oettlé, M. D. Prates, E. E. Rosenberg, H. M. Schwartz, and Dr. M. H. Silk, Prof. D. Crichton, Prof. A. E. Kark, and Prof. O. S. Heyns in collaboration with Dr. S. Shippel.

(e) *Exhibits at medical congresses.* The first exhibit was presented at the 41st South African Medical Congress, Durban 1957.

##### 2. The Education of the Lay Public

(a) *Literature.* The NCASA, with the permission of the American Cancer Society, distributed 200,000 copies each of pamphlets entitled, 'How your doctor detects cancer', and 'Breast cancer' to the personnel of insurance companies, banks, building societies, chambers of commerce and industry, mines, the S.A. Railways, the S.A. Police and all Departments of the Public Service.

(b) *Educational films,* purchased by NCASA from the American Cancer Society, are loaned for exhibition to many organizations in the Union.

(c) *A mobile cinematographic unit* visits every town in the country, presenting a programme consisting of (i) a cancer exhibition, (ii) a talk on the activities of the Association; (iii) a general talk on cancer; (iv) a film show for the general public; and (v) a medical lecture and a film on 'Breast self-examination'.

(d) *Exhibitions and shows to combat the undesirable practices of cancer quacks* are held annually at agricultural and industrial shows.

##### 3. The Care of the Cancer Patient

One of the objectives of the NCASA is the establishment of services aimed at alleviating the suffering of cancer patients, provided that these services are supplementary to, or fall outside the scope of, local or government authorities. In addition, the Association undertakes to act as agent for the cancer sufferer in helping him to get from the authorities such relief as he is legally entitled to but perhaps, through ignorance or incompetence, is unable to claim. In the furtherance of this work other organizations are rallying to the Association's aid. Thus (i) the South African Red Cross Society provides domiciliary aides for stricken cancer families, the aides being paid for their services by the Association; (ii) The St. John Ambulance Association provides

an ambulance to transport cancer patients to and from hospitals for treatment; and (iii) the Noodhulpliga renders in certain rural areas all the services provided in the cities by the Red Cross and St. John's.<sup>3</sup>

#### LECTURE BY PROF. EMERSON DAY

Prof. Emerson Day, the Director of the Strang Cancer Prevention Clinic Memorial Centre, New York, and Professor of Preventive Medicine, Sloan-Kettering Division, Cornell University Medical College, was recently invited to the Union by the *South African Practitioner* to engage in an *ad hoc* lecture tour. Professor Day gave a number of valuable and well attended lectures to medical practitioners throughout the Union on the pioneer work which is being done at the Strang Cancer Prevention Clinic on the early detection, diagnosis and management of cancer. Professor Day said the control of the cancer problem called for the application of many medical disciplines, but certain practical measures were necessary at the purely medical level. The plan followed at the Strang Clinic is directed to the attainment of 3 fundamental objectives, viz.:

- (1) to identify, detect, and remove pre-malignant lesions,
- (2) to diagnose cancer in the earliest possible stage, and
- (3) to apply to patients the most advanced methods of treatment in the way of surgery, radiotherapy, or chemotherapy.

The routine cancer detection examination which is performed at the Memorial Centre is conducted under the following heads:

1. *History* of condition, with reference to (a) systematic history, (b) history of cancer in family, (c) history of environmental exposure, (d) history of pregnancy, etc.

2. *Physical examination* of the entire body with reference to (a) Skin and node-bearing areas, (b) nasal and oral cavity, (c) pharynx and vocal cords, (d) thyroid, breasts, lungs, abdomen, male genitalia (especially prostate), (e) female genitalia (vagina, cervix, uterus, and adnexa), and (f) rectum.

3. *Laboratory investigations*, including total blood count, complete urinalysis, cytological examination of vaginal and cervical smears, examination of stools for occult blood, and tissue biopsy.

4. *Radiographic examination*, e.g. of chest, skull, bones, and gastro-intestinal tract, as and when indicated.

The performance of the routine cancer detection examination calls for, *inter alia*, a knowledge of the technique of indirect laryngoscopy and proctosigmoidoscopy, and for competence in the examination of vaginal and cervical smears, etc. The examination as outlined herein will bring a maximum number of cancer patients with minimal signs and symptoms to the attention of the surgeon or radiotherapist, as the case may be.

The physician performing the routine cancer detection examination must pay careful attention to those anatomical sites where cancer is common and which, because of their accessibility to inspection and palpation, permit of early detection of cancer. The examination of sites which are so accessible are dealt with in the following order:

#### 1. Breast

- (a) *Inspection*. The patient is examined in a good light and seated in the upright position, first with her arms at her sides, then with her hands on her hips, and finally with her arms raised above her head. Careful inspection may enable the examiner to detect one or other of the following significant changes, viz.: (i) asymmetry between the breasts, (ii) minimal degrees of skin change, (iii) nipple retraction or scaling, or (iv) nipple discharge.

- (b) *Palpation*. The breast is palpated first with the patient's arms relaxed at the side, and then with arms raised. Any positive findings are then checked by further palpation with the patient in the recumbent position, and at the same time both axillae are examined while the examiner supports the patient's elbow with his hand. The patient is next placed in the supine position and all the quadrants of the breast are carefully palpated with the tips of the fingers.

- (c) *Cytological examination of nipple discharge*. A smear should be made of any discharge from the nipple, whether sanguineous or not, and cytologically examined, since cancerous cells may be present in the absence of a palpable mass.

#### 2. Uterus

- (a) *Palpation per vaginam* of uterus and adnexa.
- (b) *Visualization* of the cervix and vagina with a speculum.

A careful note is taken of the presence of the following signs which are suggestive of early malignancy, viz.: (i) vaginal bleeding or spotting, (ii) menorrhagia, (iii) cervical erosion, (iv) contact bleeding, and (v) failure to respond to the Schiller iodine test.

- (c) *Cytological examination*, by means of the Papanicolaou technique, of (i) vaginal smear, (ii) cervical smear, and (iii) endometrial smear. (The glass slides are immediately fixed in a solution of equal parts of 95% alcohol and ether.)

- (d) *Biopsy examination* of any suspicious area visualized by ordinary inspection, or any localized area of the cervix which fails to take the iodine stain in uniform fashion.

#### 3. Rectum and Colon

- (a) *Digital palpation of the rectum*, noting the occult blood on the examining finger which signalizes the presence of cancer of the rectum and colon or elsewhere in the bowel.

- (b) *Proctosigmoidoscopy*, which should form an integral part of every cancer detection investigation in every person over the age of 40. The presence of polyps, which is a pre-cancerous condition, should always be looked for.

- (c) *Examination of stool for occult blood* (following a 3-day meat-free diet).

- (d) *Barium enema* with air contrast (in all polyp cases).

- (e) *Biopsy* of all polyps encountered.

#### 4. Stomach

- (a) *Radiographic examination* of the upper gastro-intestinal tract. Photofluorographic survey films of the barium-filled stomach are taken to screen all stomach cancer suspects for more elaborate diagnostic study. A formal gastro-intestinal series may be recommended on the basis of abnormalities encountered on survey photofluorographic views. This technique narrows the number of patients requiring gastro-intestinal series to approximately 2% of the total seen.

- (b) *Estimation of gastric acidity* is important because patients with achlorhydria or hypochlorhydria are more liable to gastric cancer than others, and where either is present a periodic radiological examination of the gastro-intestinal tract is made. Gastric analysis is carried out after the method of Segal ('tubeless gastric analysis'), which utilizes certain properties of ion-exchange resins and their reaction with gastric contents. This determination of gastric acidity is found to increase the chance of gastric lesions being picked up by gastro-intestinal radiography.

- (c) *Gastrosocopy*. Patients with atrophic gastritis, gastric polyps or gastric ulcers are advised to undergo periodic radiological examination of the gastro-intestinal tract.

- (d) *Cytological examination of the gastric contents*.

- (e) *Examination of the blood*. Patients with pernicious anaemia run a much higher risk of gastric cancer than the average population. Approximately 10% of such patients develop gastric cancer.

#### 5. Lungs

- (a) *Radiographic examination of the chest* is especially indicated in patients over the age of 45 with a history of long-term heavy cigarette smoking or certain occupational exposures. When a single postero-anterior film suggests the presence of a pulmonary tumour it is necessary to take further films at intervals.

- (b) *Cytological examination of sputum, and of tracheal and bronchial washings*, makes it possible to arrive at a positive morphological diagnosis in 50-90% of cases. Sputum for cytological study is expectorated by the patient directly into a bottle containing 70% alcohol. The specimen must be the product of a deep cough and as free as possible from admixed saliva. At least 3 sputum specimens should be cytologically examined before being passed as negative.

- (c) *Bronchoscopy* is the most definitive diagnostic procedure in lung cancer. Nevertheless, lung cancer can be visualized bronchoscopically in about one-third of cases. Bronchial washings obtained by bronchoscopy may establish a diagnosis without actual bronchoscopic visualization.

- (d) *Thoracotomy*. The diagnosis of lung cancer can be arrived at only by operation in about 20% of cases.

#### 6. Skin

The examiner should look for lesions suggestive of epidermoid or basal carcinoma of the skin, particularly in the head and neck, and also for pigmented naevi. All these lesions, which are potentially malignant, are subjected to biopsy. Special attention is given to the presence of junctional naevi, usually located on the soles



of the feet, palms of the hands, the region of the external genitalia, and areas subjected to chronic irritation such as those around the belt, collar, brassière, etc.

#### 7. Thyroid Gland

The thyroid should be palpated for the presence of single or multiple nodules.

#### 8. Oral Cavity

The mucosa of the oral cavity is inspected for the presence of leukoplakia. Biopsies should be taken from an affected area.

#### 9. Blood

Blood examination is essential for the detection or diagnosis of malignant lymphomas and leukaemias.

#### 10. Peripheral Lymph Nodes

Enlargement may be suggestive of Hodgkin's disease, lymphosarcoma, etc.

#### 11. Prostate

Digital palpation of prostate is the only rewarding detection technique in carcinoma of the prostate. The presence of a firm, solitary nodule in a man aged 50 or over is considered as carcinoma until proved otherwise.

#### 12. Urine

Routine urinalysis is done in the hope of finding gross or microscopic haematuria.

#### 13. Oesophagus

An oesophagram, supplemented by cytology as well as oesophagoscopy, is resorted to.

#### 14. Pancreas

The detection or diagnosis of carcinoma of the pancreas can only be adequately achieved by exploratory laparotomy.<sup>4</sup>

#### CONCLUSION

The examination routine followed by Emerson Day and his associates at the Strang Clinic has made possible the detection of cancer in its early stages in many thousands of people who would otherwise have come too late for therapy. In paying tribute to the Strang Clinic, one cannot refrain from expressing the hope that a similar institute will be established in the Union of South Africa. Our need is great. We have the requisite organizational machinery in the form of the National Cancer Association of South Africa, and we have the necessary personnel splendidly trained by our five medical schools and the South African Institute for Medical Research.

#### REFERENCES

1. Memorandum and Articles of Association of the National Cancer Association of South Africa, 1931.
2. A. R. Nat. Cancer Assoc. S. Afr., 1957, pp. 1-2, 6-14, 16-21.
3. Robertson, L. S. (1958): 7th Address to Int. Cancer Congr., Johannesburg. Nat. Cancer Assoc. S. Afr.
4. O'Donnel, W. E. and Day, E. (1956): *Mod. Clin. N. Amer.*, **40**, 591.

### IN DIE VERBYGAAN : PASSING EVENTS

*Association of Surgeons of South Africa (M.A.S.A.).* The Second Congress of this Association will be held in Durban on 17, 19 and 20 September 1960. Information may be obtained from the Hon. Organizing Secretaries, 53 Medical Centre, Field Street, Durban.

*Dr. Geoffrey Dean*, of Port Elizabeth, has been awarded a research grant by the Multiple Sclerosis Society, New York, to carry out an epidemiological study on multiple sclerosis in South Africa. Dr. Dean was elected a member of the overseas panel of consulting neurologists of the Society in 1949 after he had published his first paper on disseminated sclerosis in South Africa.

*Mr. M. N. Teubes*, M.R.C.S., L.R.C.P., M.B., B.S., F.R.C.S., has commenced practice as a general surgeon at 713 Harley Chambers, Jeppe Street, Johannesburg. Telephones: Consulting rooms 22-2665, residence 42-3900. The telephone number of Mr. Teubes' consulting rooms is not listed in the current Telephone Directory.

*Southern African Cardiac Society (Cape Province Section).* Dr. Walter Beck, M.R.C.P., will lecture on 'The technique and diagnostic value of dye studies in heart disease' on Thursday 4 February at 8.15 p.m. in the E-floor Lecture Theatre, Groote Schuur Hospital, Observatory, Cape. All those who are interested are welcome to attend this lecture.

*College of General Practitioners, Cape of Good Hope Faculty.* This Faculty has now established a central office at Medical House, 35 Wale Street, Cape Town. A secretary will be in attendance during the mornings only, with a possibility of full day attendance later. All communications should be forwarded to P.O. Box 643, Cape Town. The telephone number of the office is 3-2022.

*Dr. A. L. Agranat*, Senior Physician on the staff of the Johannesburg General Hospital and lecturer in clinical medicine in the Department of Medicine of the University of the Witwatersrand, was elected a Fellow of the Royal College of Physicians of Edinburgh at a meeting of the College held on 3 November 1959.

*Dr. Allan I. Friedman*, ophthalmic surgeon, of Johannesburg, has been elected a member of the Jules Gonin Club. This club has been established for the international exchange and organization of knowledge of diseases of the retina and choroid. The advent of light coagulation has so transformed the treatment of certain

retinal and choroidal conditions that the formation of this body became almost a necessity. The club even has some members behind the 'iron curtain'. The club has been named after the ophthalmologist who first rationalized the treatment of retinal detachments.

*Prof. Derk Crichton*, Head of the Department of Obstetrics and Gynaecology, University of Natal, has recently returned from the Conference of Pelvic Surgeons of America. While in the USA Professor Crichton also undertook a lecture tour on 'Pelvic cancer' sponsored by the Rockefeller Foundation. He also visited various centres in the UK.

*Research Forum, University of Cape Town.* A meeting of Research Forum will be held on Wednesday 3 February in the Bennie de Wet Lecture Theatre, A-floor, Groote Schuur Hospital, Observatory, Cape, at 12 noon. Dr. J. A. H. Campbell will speak on 'Experimental non-dietary cirrhosis in rats'. All who are interested are invited to attend this meeting.

*Red Cross War Memorial Children's Hospital, Rondebosch, Cape.* The next meeting in the Postgraduate Seminar Series of lectures held under the auspices of the University of Cape Town, Department of Child Health, will be held in the lecture theatre of this hospital on Tuesday 2 February at 5 p.m. Dr. H. de V. Hese will speak on 'The forced-vitality-capacity test in children'. All practitioners are welcome.

*German Scientist Sent to Brazil to Work on Medicinal Plants.* A young German scientist, Dr. Heinz-Walter Raudonat, of the University of Frankfurt, has arrived in Brazil to undertake a 6-month mission for UNESCO at the University of São Paulo, where he will work with Brazilian scientists in the Faculty of Medicine at Ribeirão Preto, 100 miles from São Paulo. Research is now being conducted at Ribeirão Preto on the properties of medicinal and toxic plants found in Brazil's vast tropical regions. Dr. Raudonat, who is on leave from the Department of Toxicology at Frankfurt University, will specialize in chemical techniques of separating active substances from these plants. In this respect he has worked extensively in snake venom research and he is head of the 'snake farm' at Frankfurt, the largest in the Federal Republic of Germany. Dr. Raudonat, during his stay in Brazil, also plans to conduct a short course in the separation of snake venom at the Butantan snake farm in São Paulo, the biggest in the world with a population of 5,000 snakes.

## NUWE PREPARATE EN TOESTELLE : NEW PREPARATIONS AND APPLIANCES

### ZYNOCIN

British Drug Houses announce the introduction of Zynocin, a new antiseptic and sore-throat lozenge, and supply the following information:

Zynocin is the first preparation of its type to incorporate the new antibiotic xanthocillin, and the following advantages over existing antibiotic throat lozenges are claimed: Xanthocillin is a broad-spectrum antibiotic which has proved remarkably effective by topical application against the gram-negative and gram-positive organisms responsible for most day-to-day infections of the mouth and throat. Microorganisms do not appear to develop resistance to xanthocillin, nor is there any evidence of cross resistance to other antibiotics. Xanthocillin also inhibits secondary yeast and fungal activity and Zynocin lozenges are therefore safe and suitable for prolonged use when necessary.

The benzocaine content ensures efficient local analgesia and swift and sustained relief from pain and irritation. Finally, be-

cause of their remarkably pleasant taste Zynocin lozenges should be equally acceptable to children and adults.

Each Zynocin lozenge contains 1 mg. of xanthocillin and 5 mg. of benzocaine in a lime-flavoured base.

**Indications.** Sore throats accompanying respiratory infections; tonsillitis and pharyngitis; stomatitis and gingivitis; dental extractions; and minor surgery of the mouth where a local antibiotic is indicated.

**Dosage.** One or 2 lozenges to be dissolved slowly in the mouth every 2 hours; treatment should continue for 2 or 3 days until the condition has been controlled.

Zynocin lozenges are available in tubes of 12 lozenges.

Zynocin lozenges are manufactured by The Distillers Co. (Biochemicals) Ltd., England, and further information may be obtained from the sole importers, British Drug Houses (South Africa) (Pty.) Ltd., P.O. Box 372, Johannesburg.

## BOEKBESPREKINGS : BOOK REVIEWS

### CURARE-LIKE AGENTS

*Curare and Curare-like Agents.* Edited by D. Bovet, F. Bovet-Nitti and G. B. Marini-Bettolo. Pp. xi + 478. 85s. Amsterdam, London, New York, Princeton: Elsevier Publishing Company. 1959.

This volume constitutes the proceedings of the International Symposium on Curare and Curare-like substances held at Rio de Janeiro in August 1957. Of a wide variety of interests are 12 contributions in French and 34 in English. In fact there is almost something for everybody. There are details about the manufacture of blowpipes and poisoned darts for those who may care to use them. In the broader medical sphere there are biochemical, pharmacological and physiological contributions of the highest order. The average clinician (of which your reviewer is one) will no doubt struggle with the stereochemical interpretations of the processes of neuromuscular block. But for each, in his respective line, there is comprehensive material—for the biochemist, physiologist, pharmacologist and anaesthetist.

This book can be confidently recommended to anyone seeking to increase or broaden his knowledge about the muscle relaxants and the complexities of neuromuscular transmission. P.J.

### RÖNTGENOLOGIESE DIFFERENSIËLE DIAGNOSE

*Lehrbuch der röntgenologischen Differentialdiagnostik, Band I: Erkrankungen der Brustorgane.* 4., verbesserte und erweiterte Auflage. Von Prof. Dr. W. Teschendorf, unter Mitarbeit von Priv.-Doz. Dr. P. Thurn. xii + 1,183 Seiten, 1,138 Abbildungen. DM 210.00. Stuttgart: Georg Thieme Verlag. 1958.

Die vierde uitgawe van Teschendorf se röntgenologiese differensiële diagnose van die borskasorgane is 'n standaardwerk. Die versoeking om dit 'n monumentale werk te noem, is groot. Die doel is om die röntgenologiese differensiële diagnose voorop te stel, en gevolglik word die afwykings, sover dit die longe betref, hoofsaaklik gegroepeer volgens die röntgenologiese voorkoms. As voorbeeld kan genoem word die differensiële diagnose van drie-hoekige skadus in die toppe of die basisse. Voorbeelde van die verskillende oorsake word gegee, bespreek en gedokumenteer na aanleiding van die jongste literatuur.

Die literatuuroorsig is besonder uitgebreid en omvattend en bygewerk tot vandag. In hierdie opsig, wat as 'n nuwe produk beskou kan word, vorm die werk 'n nuttige gids.

Die skrywer stel dit hom ten doel dat die 1,138 afbeeldings tot die leser spreek, omdat die röntgenologiese diagnostiek, soos hy dit stel, op die ondersoek en vergelyking van die grootste moontlike aantal opnames berus.

Daar word duidelik gestel dat die middelkwabsindroom ook by volwassenes voorkom en nie, soos soms aangeneem word, tot kinders beperk is nie. Tomografie kom sterk tot sy reg. In emfiseem kan die verwyding van die sentrale longarterieë, en die vernouing van die perifere arterieë, duidelik deur tomografie gewys word, waaruit afgelei kan word dat pulmonale hipertensie aanwesig is. Ook van transversale tomografie is daar baie voorbeelde.

Die tweede deel van die werk behandel die röntgenologiese differensiële diagnose van hartletsels. Byna 400 bladsye word hieraan gewy. Al die ondersoekmetodes, insluitende kimografie, elektrokimografie, hartkateterisasie, angiokardiografie en retrograde aortografie, word verduidelik. Diegene van ons wat nie in die eerste plek kardioloog is nie vind dit soms moeilik om 'n omvattende beeld te kry van die fyner besonderhede in die differensiële diagnose van aangebore en ander hartletsels. Sonder huiwering kan hierdie werk aanbeveel word as 'n antwoord op die probleme van diesulkes. Dit is selde dat 'n leerboek teengekome word waarin die röntgenologiese hartdiagnostiek so duidelik en eenvoudig beskryf word soos hier.

Verder word daar aparte afdelings gewy aan die aorta, diafragma en esofagus. Sover dit die esofagus betref is daar seker weinig bekende toestande wat nie bespreek word nie. Van verskillende standaardwerke wat geraadpleeg is, was dit die enigste waarin uitsonderlike toestande soos esofageale afwykings by limfiese leukemie behandel word. Teschendorf was reeds bekend as 'n röntgenologiese werk uit die hoogste rakkie—die vierde uitgawe versterk hierdie opvatting. A.D.K.

### HEREDITY COUNSELLING

*Heredity Counseling.* By 17 authors, edited by Helen G. Hammons. Pp. xv + 112. \$4.00. New York: Paul B. Hoeber, Inc. 1959.

This work contains within its comparatively narrow compass a record of a symposium sponsored by the American Eugenics Society held at the New York Academy of Medicine Building. The 17 contributors include such leading authorities as Dice, Falls, Glass, Herndon, Kallmann, Oliver, Sheldon C. Reed and Schull.

In Part I, genetics and eugenics in relation to such important special fields as paediatrics, dentistry, public health nursing and cardiovascular disease receive consideration. In Part II heredity counselling as such, including the structure of heredity counselling services and the organization of heredity clinics, the methods employed by the heredity counsellor, the procedures of referral to counsellors, and the features of good and inadequate counselling are explored. Kallmann's mellow wisdom on the last-named theme, based on a lifetime of work and thought in the field, appears in the section entitled 'counseling without sin'. The detailed division into procedures of referral, types of problem and types of advice in sections 7-10 furnishes the reader with a concrete, practical approach to heredity counselling.

Like Sheldon C. Reed's work of the same name that appeared in 1955, the present work is a milestone and adds to the earlier work both in details of procedure and application in new fields of medicine. It is compendious, clear, and a 'must' for workers in relevant disciplines, including the general practitioner who is in daily contact with the problems it discusses. L.A.H.

## OMKEERBARE NIERSVERSAKING

*Reversible Renal Insufficiency.* Diagnose en behandeling. Deur Donald H. Atlas, M.D., Ph.D., F.A.C.P. en Peter Gaberman, M.D. Pp. x + 233. 19 illustrasies. 56s. Londen: Baillière, Tindall en Cox Bpk. 1958.

Deel I van hierdie boek gee 'n goeie aanduiding van huidige begrippe oor die benadering en behandeling van akute nierversaking. Geen nuwe standpunt word gestel nie en die inligting is opgesom uit teenswoordige literatuur. Die skrywers het self blykbaar nie groot ervaring van radikale behandelingsmetodes, soos 'n kunsnier, nie. Hulle staan dus nie veel plek af aan hierdie aspek van behandeling nie.

Deel II handel oor chroniese, moontlike omkeerbare, letsels en 'n mens is verwonderd om dan ook kort beskrywings te kry van sulke toestande soos byvoorbeeld, jig-nefritis en polistiese niere. Die uitgangspunt is tog die beheer van tydelike groter aanvraag na nierfunksie by sulke toestande.

Die hoofstuk oor kalsiummetabolisme en chroniese nierversaking is buite verhouding groot en weerspieël dan die skrywers se eie stokperdjie op dié gebied. Omrede van dié voorkeur, waarskynlik, is hierdie tog die nuttigste gedeelte van die boek.

Waar die werk in sy geheel dien as 'n oorsigtelike verhandeling, kan die boek as geslaagd beskou word en sal die lees daarvan lonend wees aangesien daar op hierdie gebied tans 'n vinnig groeiende groot literatuur, en dikwels 'n uiteenlopende gedagtegang, te vinde is. A.J.B.

## GEWASSE VAN DIE KOP EN NEK

*Treatment of Cancer and Allied Diseases.* 2de uitgawe. Deel 3. *Tumors of the Head and Neck.* Deur 70 skrywers. Geredigeer deur G. T. Pack, M.D., F.A.C.S. en I. M. Ariel, M.D., F.A.C.S. Pp. xviii + 781. 1,028 illustrasies. \$30.00. New York: Paul B. Hoeber, Inc. 1959.

Hierdie is nog 'n bundel in die reeks van 9 oor bogenoemde onderwerp. In die eerste 3 hoofstukke word sulke onderwerpe soos verspreidingsroetes en die gebruik van algemene en lokale narkoses by chirurgie van die kop en nek volledig behandel. Daar is ook 'n hele hoofstuk oor die pre- en postoperatiewe behandeling wat by hierdie gevalle toegepas word.

In die daaropvolgende hoofstukke word iedere deel van die kop en nek, bv. die lippe, tong, mondholte, kaak, harde en sagte verhemtes, die oor, oog, larinks, en kliere, soos die speekselkliere, tiroïed en paratiroïed volledig bespreek. Deurgaans vind 'n mens dat wat die behandeling betref, die chirurgiese sowel

as die röntgenologiese benadering van die gevalle volledig bespreek word.

Plastiese prosedures sowel as die gebruik van prosteses by chirurgie van die kop en nek is ander hoofstukke wat die bundel pragtig afrond.

Die bundel is deurgaans pragtig geïllustreer met tekeninge van die stappe van operatiewe ingrepe. Dis 'n bundel wat met reg sy plek by die ander 8 moet inneem op die rak van enige mediese biblioteek. J.J.D.J.

## MEDICINE IN INDO-CHINA

*Doctor in the Asian Beyond: The Edge of Tomorrow.* By Thomas A. Dooley. Pp. xiv + 208. Illustrations. 16s. Londen: Victor Gollancz Ltd. 1959.

This is the full story of the personal mission of Dr. Dooley and his friends to the underprivileged of Laos in Indo-China. Some readers may have read the condensed version in the *Reader's Digest* of September 1958 under the title of *The Edge of Tomorrow*. It is an interesting account of modern medicine taken, as far as was reasonably possible, to a primitive people who had only known the doubtful services of witch-doctors. With similar conditions in Africa on our doorstep, this book is a challenge and an inspiration to all who have the gift of healing and understand what Schweitzer calls 'The Fellowship of Those Who Bear the Mark of Pain'. A.H.T.

## THE STRUCTURE OF THE KIDNEY VESSELS

*Die Gefässarchitektur der Niere.* Untersuchungen an der Hundeniere. Heft 5. Von Prof. Dr. A. von Kügelgen, Dr. B. Kuhlo, Dr. W. Kuhlo and Dr. Kl.-J. Otto. vii + 112 Seiten. 89 Abbildungen. DM 47.00. Stuttgart: Georg Thieme Verlag. 1959.

This book consists of 3 parts, which deal with the arterial system, the venous system and the anatomical relations between arteries and veins, in the kidneys of dogs. The authors injected 'plastoid', a vinyl compound, into arteries and veins and macerated the kidneys after the 'plastoid' was polymerized. Thus they obtained complete casts of the injected vessels which could be studied under a stereomicroscope. The many new observations and results cannot be mentioned in a short review, but everybody who is interested in the kidney, its functions and diseases should read this interesting book. H.W.W.

## BRIEWERUBRIEK : CORRESPONDENCE

## STERILISASIE VIR SEKSUELE OORTREDINGS

*Aan die Redakteur:* Ook ek moet vir oulaas nog 'n stuiwer in hierdie waaragtige armbeurs dompel, want, tensy ons aanneem dat vroumense hier ter lande mansmense onsedelik aanrand in plaas van andersom, skuld dr. v. d. Westhuyzen u lesers minstens een verskoning. Hy skryf: 'Hulle (Bantoe-mans) is glad nie die onbenullig klein gedeelte van seksuele oortreders soos dr. Mostert dit uit my brief uitmaak nie'.<sup>1</sup> (Nêrens het ek nog sover enige 'konstruktiewe' voorstel in sy briewe teengekom nie, slegs maar sy knaende 'destruktiewe' belangstelling in kastrering vir Bantoe-seksmisdadigers.) Feit is: most of the 2,451 people convicted in the Union for offences under the Immorality Act in the 8 years from 1950 to 1957—about 92%—were European men and African and Coloured women.<sup>2</sup>

I should like those without a good knowledge of Afrikaans to know that Dr. v. d. Westhuyzen ignores the Christian and Hippocratic tradition, preferring inadmissible excursions into politics. Thus he claims: 'Other countries are not faced by a problem such as we possess, hence they can teach us nothing. And there are still many other similar problems.' (My italics.) He leaves the meaning of this last sentence mysteriously to anybody's guess. (I suggest it includes at least the principles of Roman-Dutch Law, judging from his irrelevant Biblical quotation in answer to St. Paul's letter to the Colossians ch. 3 v. 1-17 in which racial differences are explicitly discussed.)

One is reminded of the 'blood-cement' methods used in Germany during the last war to corrupt honourable men in the medical profession, by inculcating guilt feelings and a sense of responsibility for acts committed by assistants, especially where the criminal feature of the action was rationalized along the lines suggested by Dr. v. d. Westhuyzen, viz., pharisaical racial pride and presumptive patriotism. Punitive sterilization cannot fail to profane the operator, just as the children's book, which was designed to elucidate the facts of life in terms of bees and flowers, did not so much render sex 'clean', as it made botany salacious.

Future correspondents would do well to ponder the conclusions of Kinsey based on a 'scientific' inquiry and review of the literature. He refers to 'the fallacy of castration as a cure for sex criminals (since such criminal violence is often the result of the conflict of weakened potency and strong sexual impulses)', and sums up: 'There is no doubt that the recurring interest in castration as a legal punishment is, at least in part, a product of the same sadistic eroticism which has inspired genital mutilation throughout human history'.<sup>3</sup>

J. W. Mostert.

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6 January 1960

1. Briewerubriek (1960): S. Afr. T. Geneesk., 34, 19.
2. Rand Daily Mail, Johannesburg, 15 October 1959.
3. Kinsey, A. C. (1953): *Sexual Behaviour in the Human Female*, pp. 739 and 741. Philadelphia and London: W. B. Saunders.